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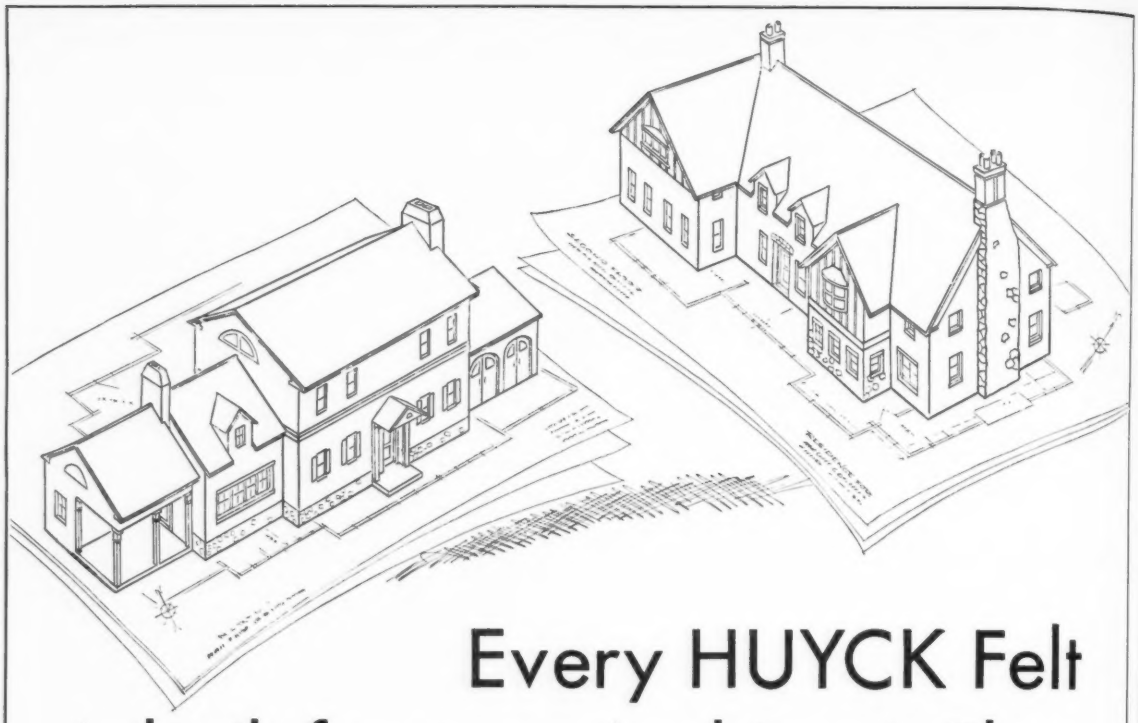

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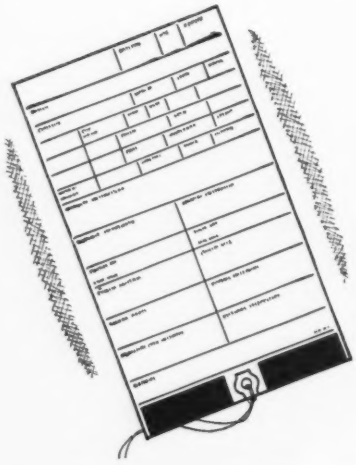

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Wisconsin Plans $26,000,000 Power Project

Application Before P.W.A. for Loan To Help Finance Big State Water Power Development To Give Paper Mills Adequate Power—Free Shipment of Foreign Pulp Demanded—Pollution In Wisconsin—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 1, 1938—A $26,000,000 development which will give paper mills on the Wisconsin and Fox Rivers ample water power at all times as well as leading to ultimate expansion of operations was made public last week. It emanates from the Wisconsin Development Authority, a state body similar to the government's TVA, created at the last session of the Wisconsin Legislature.

An application is before the Public Works Administration at Washington for the $26,000,000 grant, 45 per cent of which will be appropriated outright, the remaining 55 per cent to be a loan. If the grant is given by P.W.A., the Wisconsin Hydro Authority will be created to administer the project under W.D.A. A reservation already has been made with the secretary of state at Madison, Wis., for incorporation of Wisconsin Hydro Authority, with Gov. Philip F. La Follette, Attorney General O. S. Loomis, and Secretary of State Theodore Dammann as the potential incorporators. It will be a non-stock, non-profit corporation with quasi-public powers.

Plans Include Huge Storage Reservoir

The program includes construction of a storage reservoir of immense capacity on the Little Eau Pleine River, to store surplus water in this river and the Wisconsin River. The water would be diverted to the Wisconsin by a canal and tunnel.

Construction of three new hydro-electric plants on the Wisconsin River. One would be at Knowlton, Wis., below the mouth of the Eau Pleine; a second at the Batenwall site, about 50 miles further downstream, and a third at the Germantown site, twelve miles below Batenwall. The estimated cost of these plants is $10,950,000.

Provision for diversion into the Fox River at Portage of surplus waters of the Wisconsin River, either by a new canal or by increasing the capacity of the present canal. The diversion would be based on 1,500 cubic feet per second for 120 days during the summer and fall. The estimated cost is $500,000.

There are 22 plants providing power for existing industries on the Fox and Wisconsin. Their power increase, with the addition of three new plants, is estimated at 91 per cent. These mills are capable of absorbing all the additional power generated.

These plans have been prepared by the Wisconsin State Planning Board after an exhaustive study for the last two years. They are found to be feasible, since none of the construction projects is doubtful, or has any serious obstacles to fulfillment. The board, in its report to the governor, predicted a doubling of employment opportunities in the paper industry of the Fox River Valley, with a probable increase in annual earnings of $11,000,000, or 93 per cent. Benefits to mills in the Wisconsin River Valley would be even greater, the board said.

Reservoirs to Prevent Annual Floods

The proposed storage reservoirs on the Wolf River would be at North Lily and Leeman, Wis. They would alleviate annual flood conditions on the Wolf and Fox Rivers, and permit a higher level in the Lake Winnebago storage pool, now restricted by the War Department. The North Lily reservoir would store 6,108 million cubic feet, or 140,000 acre feet of water, and would cost about $420,000. The Leeman site would store an estimated 3,054 cubic feet, or 70,000 acre feet, at an estimated cost of $533,000. These reservoirs would make available for diversion to the Fox River an additional 700 to 800 feet per second for a period of 120 days a year. The total, with the diversion from the Wisconsin River, would be more than 2,000 feet, and would provide a welcome relief to paper mills now handicapped by serious interference.

The report points out that four paper mills have closed down permanently because of a shortage of water power. Two more mills are dependent entirely on water power. Employment at these is directly in proportion to power.

Original Plan Changed to State Project

Originally, the reservoir on the Little Eau Pleine River was to have been a part of the development contemplated by the Wisconsin Valley Improvement Company, and financed by the Consolidated Water Power and Paper Company, one of the biggest power users on the Wisconsin River. On July 11,

(Continued on page 18)

Ground Wood Mill of Abitibi Co. Reopened

Sturgeon Falls Plant of Abitibi Power & Paper Co. Resumes Operation After Eight-Year Shutdown—Court Approves Great Lakes Paper Settlement — Canadian International Mill Reopened—Other Late Mill News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 1, 1938—It was reported recently that the ground wood mill of the Abitibi Power and Paper Company, Limited, at Sturgeon Falls, Ont., had been re-opened for the first time in eight years. Not a single piece of the equipment was condemned by a Toronto engineer, according to H. B. Gibbs, who heads the syndicate of eighty-five Sturgeon Falls, North Bay and Sudbury businessmen who have backed the placing of the plant into production of ground wood pulp. It was stated that only minor repairs were necessary. Mr. Gibbs says that so far thirty-five Abitibi employees have signed agreements whereby they take payments in syndicate stock for their work until there is revenue from the sale of the pulp. He added it was thought that it would require at least six weeks to get the mill in operation but, with the plant in such good shape, it should be under wav in half that time.

G. T. Clarkson, Toronto, receiver of the Abitibi Company, declares that advices regarding the resumption of activities at Sturgeon Falls are without foundation. Several men were on the premises lately to remove certain debris and permit a Toronto engineer to make measurements which he required and so far such men and Abitibi representatives constituted the only persons on the property. According to Mr. Clarkson, no lease has been arranged. Neither has the syndicate satisfied the Abitibi Company as to the adequacy of its resources to pay any moderate rental for the property and carry on the operations proposed, the ultimate success of which, in the opinion of Abitibi officials, is open to doubt.

Court Approves Great Lakes Co. Settlement

An order sanctioning a proposed arrangement between Great Lakes Paper Company in liquidation and its creditors has been granted by Justice Greene in Chambers. This order in no way has to do with the affairs of the present Great Lakes Paper Company, Limited. The Great Lakes Paper Company, Limited, on June 26, 1936, purchased the assets from the receiver of the Great Lakes Paper Company, Limited, which went into receivership in July, 1931. Some confusion arose over the order owing to the similarity in the names of the two companies. The purpose of the recent order by Mr. Justice Greene was to distribute the stock in the new company, the Great Lakes Paper Company, Limited, allotted to the liquidator at the time of the sale three years ago. At that time 10,000 class "A" preference shares and 20,000 common shares were allotted to the liquidators to satisfy claims of ordinary creditors. These shares were the only assets of the liquidated company remaining after the sales and after deduction of expenses may now be distributed pro rata.

Canadian International Mill Reopened

The mill of the Canadian International Paper Company, Limited, at Hawkesbury, Ont., which was shut down for some three weeks, resumed operations at the beginning of July. It was thought there would be only two weeks' work but it was decided lately to keep the plant in operation for a while longer. It has not been decided as yet whether the mill will continue to operate during all of August.

To Sell Lake Sulphite Pulpwood

In weekly court in Toronto, Justice Greene granted three orders allowing G. S. Currie, receiver and manager of the Lake Sulphite Pulp Company, Limited, to sell certain machinery for $1,990 and to sell not more than 11,000 and not less than 9,500 cords of pulpwood at $10.50 a cord. The third order permitted the receiver to acquire a license of occupation at Chubby Harbor.

Ontario Paper to Erect Houses

The Ontario Paper Company, Thorold, Ont., has awarded the contract for the erection of fifteen houses at Comeau Bay at an outlay of eighty thousand dollars or about five thousand three hundred dollars per unit.

Harry Warder Employed 52 Years

Harry Warder, for fifty-two years employed by the American Sales Book Corporation at Niagara Falls, N. Y., and Mrs. Warder have been visiting at Ivanhoe and Belleville, Ont. Mr. Warder enjoys the distinction of having a press named in his honor. In June last he was seventy-five years old and observed the fifty-third anniversary of his wedding. He is the oldest active member of the Printing Pressmen's Union of North America and was born in London, Eng. For over half a century he has been a resident of Niagara Falls, N. Y.

Hon. Peter Heenan in Automobile Accident

Hon. Peter Heenan, Minister of Lands and Forests for Ontario, suffered head injuries lately when his automobile hit loose sand and rolled over near Wabigoon, twelve miles east of Dryden, Ont. Mr. Heenan was accompanied by his two sons, one of whom received a cut over the eye.

Leo Charles on Business Trip to England

Leo Charles, of Toronto, president of the Victoria Paper and Twine Company, Limited, left recently on a business trip to England. Mr. Charles, who is also head of the Garden City Paper Mills Company, Limited, St. Catharines, intends looking into the market situation overseas.

Tug *Abitibi* in Pulpwood Service

The new tug "Abitibi," which is owned by the Abitibi Power and Paper Company, Limited, Toronto, will be used for towing rafts of pulpwood. This makes the second tug recently built for the company. The tugs are the first Canadian built vessels to be fitted with Kort nozzles which are expected to increase propulsive efficiency by about forty per cent. The "Abitibi" is forty feet over all and is powered by twin Polar Atlas diesel engines.

Financial News of Pulp and Paper Industry

American Writing Paper Shows Loss of $81,085 for First Six Months of Year — National Gypsum and Subsidiaries Report Net Profit of $395,503 for Six Months To June 30—Hinde & Dauch Paper Co. Earns $320,940.

NEW YORK STOCK EXCHANGE

High, Low and Last for the Week Ending Aug. 3, 1938

	High	Low	Last
Armstrong Cork Co.	45	43¼	43¼
Celotex Corp.	24	21⅞	21⅞
Celotex Corp., pf.	70	67½	70
Certain-Teed Products Corp.	9¼	9	9¼
Certain-Teed Products Corp., pf.	37⅛	34⅜	35
Champion Paper & Fibre Co.	28	27	27
Congoleum-Nairn Co.	25	23½	24⅝
Container Corp. of America	16⅛	15½	15⅝
Continental-Diamond Fibre Co.	10½	9¾	10
Crown-Zellerbach Co.	15⅝	12⅝	12⅝
Flintkote Co.	23	21⅛	21½
Robert Gair	5	4⅜	4⅜
Robert Gair, pf.	16⅜	15½	16
International Paper & Power	10½	9⅜	9¾
International Paper & Power, pf.	44½	41¼	41¼
Johns-Manville Corp.	96	93	94½
Kimberly-Clark Corp.	29⅛	28¾	28⅞
MacAndrews & Forbes	31	30¾	30¾
Masonite Corp.	50	46½	50
Mead Corp.	14⅜	13¾	14¼
Mead Corp., pf.	70	70	70
Paraffine Companies, Inc.	49½	46	47
Ruberoid Co.	27⅞	23¼	24⅞
Scott Paper Co.	46¾	46	46⅝
Sutherland Paper Co.	30¼	29¼	29¼
Union Bag & Paper Corp.	14½	13½	14¼
United Paperboard Co.	7¼	6⅞	7¼
U. S. Gypsum Co.	90	87⅛	89
U. S. Gypsum Co., pf.	169	169	169

NEW YORK CURB EXCHANGE

High, Low and Last for the Week Ending Aug. 3, 1938

	High	Low	Last
American Box Board Co.	11⅛	10	10
Brown Co., pf.	29¼	25	25
Great Northern Paper	29	28⅞	28⅞
St. Regis Paper Co.	3¾	3½	3⅝
St. Regis Paper Co., pf.	62½	58	62½
Taggart Corp.	6⅛	5½	6

American Writing Reports $81,085 Loss

HOLYOKE, August 1, 1938—The American Writing Paper Corporation showed a loss of $81,085.15 for the first six months of this year, according to a statement to the stockholders issued today by Thomas H. Blodgett, chairman of the board of directors. This figure was arrived at after all expenses before interest on secured notes payable to the Federal Reserve Bank of Boston ($3,671.25) and before providing for interest on General Mortgage Bonds.

This similar period of 1937 showed a profit of $113,449.06. This figure was arrived at on a comparable basis, there being adjustments to the predecessor company's figures prior to April 1, 1937, and after all expenses but before interest on secured notes payable ($13,731.17), general mortgage bonds and Federal income taxes.

The loan of $500,000, made from the Federal Reserve Bank of Boston, at the inception of business April 1, 1937, when the corporate structure underwent certain changes, has been entirely repaid, according to today's statement.

At the close of business June 30, 1938, the corporation has cash on hand of $565,517.36 as against a balance of $435,347.70 in 1937.

Inventories showed finished paper to the value of $479,793.91; paper in process, $166,649.41; raw materials in process, $39,696.04; raw materials, $220,310.63; supplies, $58,474.87; total, $964,924.86.

National Gypsum Reports $395,503

The National Gypsum Company and subsidiary reports as follows for the six months to June 30: Net profit, $395,503, equal after dividend requirements on 7 per cent first and 5 per cent second preferred stocks to 20 cents each on 1,234,458 shares of $1-par common stock. Net last year was $509,880, or 30 cents each on 1,174,382 common shares. Company states that of the 20 cents a share earned in first half of this year 17 cents was made in the second quarter. Balance sheet as of June 30 last shows current assets, including $2,129,601 cash and United States Government securities, amounted to $5,696,345 and current liabilities were $698,636, compared with cash and United States Government securities of $2,192,414, current assets of $5,857,952 and current liabilities of $695,369 on June 30, 1937. Inventories were $1,648,894, against $1,388,522. Total assets of $14,825,474 compared with $12,890,996 on June 30, 1937. Capital surplus was $4,217,206, against $3,889,584, and earned surplus was $544,879, against $429,887. Funded debt totaled $3,448,000, compared with $1,997,000 a year earlier.

Scott Calls Sinking Fund Bonds

Scott Paper Company announces that, in accordance with the sinking fund requirements of its $4,000,000 issue of 3¼ per cent debenture bonds due 1952, $106,000 principal amount of bonds are being called for redemption September 1, 1938, at 105. An additional $37,000 principal amount of bonds, completing the September sinking fund requirement, has been presented by the company for cancellation.

Bonds drawn for redemption can be converted up to and including Aug. 27, 1938, into 25 shares of the common stock of the company for each $1000 principal amount of bonds.

Hinde & Dauch Earns $320,000

The Hinde & Dauch Company and Subsidiaries report as follows for the six months to June 30: Net profit, $320,940, equal, after dividend requirements on $5 cumulative preferred stock, to 64 cents each on 360,250 common shares, against $809,006 or $1.97 a share on 360,000 common shares last year. Earnings for the 1938 period include dividends of $72,371 received from Hinde & Dauch Paper Company of Canada, Ltd.

Ruberoid Reports Income of $199,037

The Ruberoid Company for the quarter ended June 30 reports net income $199,037, or 50 cents a share, against net loss of $193,758 in previous quarter and net income of $341,771, or 86 cents a share, in June, 1937, quarter. For six months ended June 30, net income $5,278, or 1 cent a share; for same 1937 period, net income $474,427, or $1.19 a share.

Social Activities at Green Bay TAPPI Convention

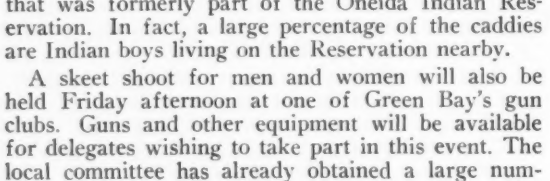
A registration of more than 500 out-of-town visitors is expected for the TAPPI Fall Meeting to be held in Green Bay, Wis., September 8-9-10. Green Bay has been selected for this year's Convention because of its importance and prominence in the manufacture of pulp and paper, ranking the world's largest producing center for personal-use types of paper. The General Committee met a week ago with R. G. MacDonald, of New York City, Secretary of the Association, and adopted the completed plans for the Convention program.

A large number of interesting technical papers are scheduled for the morning and afternoon business sessions on September 8-9-10. These papers will cover subjects pertinent to all executives and technical men connected with the paper industry.

Friday afternoon, September 9, will be a period of recreation for visitors attending the Convention. A golf jamboree will be held at the Oneida Country Club. This course is one of the sportiest in the middlewest and offers a severe test to the prowess of any golfer. The course is laid out on the site that was formerly part of the Oneida Indian Reservation. In fact, a large percentage of the caddies are Indian boys living on the Reservation nearby.

A skeet shoot for men and women will also be held Friday afternoon at one of Green Bay's gun clubs. Guns and other equipment will be available for delegates wishing to take part in this event. The local committee has already obtained a large number of valuable prizes that will be awarded to winners of the golf and skeet tournaments in connection with the formal dinner and dance to be held at Riverside Friday evening, September 9.

A Harvest Festival Costume Ball will be held at Riverside, combined with a dinner Thursday, September 8. The ballroom will be appropriately decorated, carrying out a typical Wisconsin harvest theme. Costumes for men will be overalls, blue denim shirts, straw hats and bandanna handkerchiefs. For the women, the attire of the evening will be gingham or calico dresses and sunbonnets. Prizes will be given for originality of costume.



THE GREEN BAY PACKERS BEGIN SEASON ON DAY AFTER TAPPI MEETING. MANY TAPPI MEN WILL REMAIN TO SEE GAME WITH CLEVELAND CARDINALS.

The next evening a formal ball and banquet will be held at Riverside, with a speaker of national prominence to be announced later. Entertainment during the banquet will be furnished by the Y.M.C.A. Glee Club that appears each summer season in the Empire Room of the Palmer House, Chicago. Entertainment interspersed in the program for the balance of the evening will be a floor show obtained from one of Chicago's famous night clubs.

Arrangements have been completed to obtain Bill Carlson's NBC orchestra for Thursday and Friday night activities. This orchestra is a favorite in the middlewest having played before record-breaking crowds at one of Chicago's most popular amusement places, the Trianon ballroom.

The Saturday program will cover a general session in the morning, after which TAPPI members will leave for Maxelton Braes, where golf will be played in the afternoon, climaxed by dinner and special entertainment in the evening. Maxelton Braes is one of the show places of the beautiful Door County peninsula area. A feature of the eighteen-hole golf course is the nineteenth hole, where a medal is awarded to all players making this hole in one. Those not wishing to play golf on Saturday can spend a profitable afternoon driving around the peninsula to take in many attractive and interesting sights such as Potawatomi Park, Eagle Bluff and the Bay Shore of Green Bay and Lake Michigan.

Women's Program

The women's program has been arranged with careful thought to thoroughly entertain Mrs. Paper Maker. A luncheon will be served at the Beaumont Hotel Thursday noon, September 8, followed by a tour of the authentic historical points of interest in and around Green Bay and a trip through the Kraft-Phenix plant, the largest processed cheese plant in the world. The afternoon activities will be completed with a tea at the Oneida Country Club.

Friday, arrangements will be made to take the women visitors on a trip along the Bay Shore with a stop at Nicolet Landing to view historical relics and a luncheon and bridge at the new Rockwood Lodge situated on a high wooded bluff overlooking the expansive waters of Green Bay. This is the place where the townspeople go on summer evenings to view the beautiful sunsets over Green Bay.

The final highlight of the Green Bay TAPPI Meeting will be a professional football game on Sunday, September 11, between the Green Bay Packers, four times World's Champions, and the Cleveland Rams. A special block of seats has been set aside for this game to enable TAPPI members to attend in a body. Both the Green Bay and Cleveland teams have a number of All-American players on their roster and it will be a timely opportunity for any visitors to witness a professional football game if they have not had the chance in their own community.

Obituary

Charles Holmes Herty

Dr. Charles H. Herty, the famous chemist, who in recent years has become widely known in connection with his investigations of the paper making materials of the South, died at Savannah, Ga., July 27, after a brief illness.

Charles Holmes Herty, through his perseverance and technical skill in developing the use of Southern pine for the manufacture of all types of paper, was almost directly responsible for one of the greatest industrial and agricultural transformations in the history of the South. This was his pet project, but he already had placed the nation in his debt through his work in making German vat dyes available to American manufacturers after the World War, and in his research which led to the revolutionizing of the turpentine industry.

Dr. Herty had been convinced of the value of Southern pine in the manufacture of paper for a long time, but it was not until six years ago that he got his opportunity to prove his premise. In 1932 he became director of the division of pulp and paper research of the Georgia State Department of Forestry and Geological Development, and this led to the establishment of a laboratory in Savannah in which he perfected his processes.

Southern slash, or yellow, pine had been used for years for the manufacture of kraft, but the makers were not convinced that there was enough pine in the South to warrant the building of more mills.

Dr. Herty was convinced that not only was there enough pine, but that a steady supply could be maintained. He was thinking of the development in terms of new industries for the South and new opportunities for Southerners, and his research proved he could supply both.

He produced white paper and newsprint which could be made at a considerable saving. He carried his experiments further and found he could make newsprint from black gum wood. His work with the pine trees produced a fatty by-product useful in the manufacture of soap, and his work with the gum trees disclosed a new source of rayon.

Dr. Herty's contribution to the turpentine industry was made early in the century, when he was a professor of chemistry at the University of North Carolina. He was interested in Southern pine then as a source of naval stores. Turpentine operators at the time always hacked deep into a tree to make a recess, or "box," which would gather about a quart of turpentine. The trees were being killed, and Dr. Herty decided that something should be done.

His investigations showed that turpentine normally was not contained in the tree. The liquid was manufactured naturally when the inner bark was wounded. Thus he discovered not only that the deep slash was not necessary, but that the tree produced about 25 per cent more turpentine if only the inner bark was bruised. He developed the turpentine cup which was nailed to the tree. It now is in universal use.

Dr. Herty was born in Milledgville, Ga., on December 4, 1867. He studied at the University of Georgia, from which he was graduated in 1886, and four years later he received his Ph.D. from Johns Hopkins University. After studying abroad for some time he returned to Georgia to teach for two years, after which he served with the United States Bureau of Forestry for several years.

He returned to teaching at the University of North Carolina until 1916, when he became editor of *The Journal of Industrial and Engineering Chemistry*. In 1919 President Wilson sent Dr. Herty abroad to negotiate with reparations authorities for the purchase of impounded stocks of German dyes to fill consumers' needs for products not then manufactured here. He found these supplies insufficient, and bargained directly with the leaders of the German dye trust to arrange for the importation and purchase of dyes through the Textile Alliance, thus protecting consumers here from exorbitant prices.

In 1921 Dr. Herty was made president of the Synthetic Organic Chemical Manufacturers' Association, and held that position until 1926, when he became adviser to The Chemical Foundation, Inc. He already had served as president of the American Chemical Society in 1915 and 1916. When the National Recovery Administration was active, he served as deputy administrator of the chemical industries. He was a member of many chemical societies and held several honorary degrees.

Dr. Herty was a member of the Technical Association of the Pulp and Paper Industry.

Emmett Hay Naylor

Emmett Hay Naylor, who since 1914 was secretary of both the Writing and Cover Paper Manufacturers Associations, and who resigned early this year, died Wednesday of last week of a heart attack while in swimming at his summer home, Greenbriar, Cummington, Mass. Mr. Naylor, who was 52 years old, had been under doctors' care since February, but recently had been in comparatively good health.

A native of St. Paul, Minn., Mr. Naylor was the son of William Alexander Naylor and Charlotte Hay Naylor. He attended high school in Evanston, Ill., and was graduated from Dartmouth College in 1909. He later received a law degree from the New York Law School and a Master's degree from Harvard University.

From 1912 to 1914 he was secretary of the Springfield, Mass., Chamber of Commerce and later was honorary secretary-treasurer of the National Association of Commercial Organization Secretaries.

In 1914 Mr. Naylor became associated as secretary-treasurer with the Writing Paper Manufacturers Association and built it up from a small association to a large one.

During the development of the Writing Paper Manufacturers Association, Mr. Naylor also organized and was secretary of the Tissue Paper Manufacturers Association for ten years, and of the previous Book Paper Manufacturers Association for five years, and the Stationery and Tablet Association for an equal length of time, but as the Writing Paper Manufacturers Association grew, he had to give up these other organizations to devote all his time to the writing and cover interests.

In 1920, appreciating the necessity of closer cooperation among trade associations in the United States and in advancement of this movement, he was one of five to organize the American Trade Association Executives, of which he was first president and for a long while a director. The following

year Mr. Naylor was also instrumental in organizing the Trade Association Executives in New York City, and was its first president, and served for a long time upon its board of directors.

One of the first books on the value of trade associations was written by Mr. Naylor in 1918, but his outstanding work, which is still an authority—"Trade Associations—Their Organization and Management"—was produced in 1921, and is still a basic guide for many associations.

In 1923, at the request of Mr. Hoover, then Secretary of Commerce, he wrote a complete history of trade associations in America.

Mr. Naylor was president of the Child Education Foundation, national secretary of Psi Upsilon Fraternity and was a major in the Ordnance Officers' Reserve Corps. He belonged to the Union League Club.

Surviving are two daughters, the Misses Genevieve and Cynthia Naylor, and a son, Winford C. Naylor.

Plans $26,000,000 Power Project

(Continued from page 13)

1937, P.W.A. received an application for the Hydro-Electric Power Company, Wisconsin Rapids, Wis., asking $26,000,000 to build the project. Nine days later the application was revised to provide for a $5,000,000 loan and grant, but this time the application was listed as the Wisconsin River Flood Control Board, "when, as and if organized" under the Wisconsin Public Service Commission. Creation of the Wisconsin Development Authority enabled the state to take over and enlarge the project. P.W.A. engineers already have investigated the project and have made their recommendations, but no announcement has been made as to whether the report was favorable.

Free Shipment of Foreign Pulp Demanded

Free and uninterrupted shipment of pulp from European countries direct to ports on the Great Lakes was demanded in a three-day hearing conducted last week at Milwaukee, Wis., by the United States Maritime Commission. A three-man board heard the testimony of shippers who assert the North Atlantic Shipping Conference, a trade association of seaboard navigation companies, is crushing the development of Great Lakes-trans-Atlantic freight service by undertaking to regulate traffic in the midwest. This conference has been accused by witnesses of compelling midwest shippers to sign contracts providing that only ship lines belonging to the conference may carry their imports and exports, and that all such shipments must be handled through Atlantic seaboard ports.

Pollution in Wisconsin River

Pollution of the Wisconsin River is to be eliminated by a series of sewage disposal plants to be built at Wausau, Stevens Point, Nekoosa and Wisconsin Rapids, Wis., under grants being requested from the Public Works Administration. While this movement will, to some extent, remove the difficulty of mill waste, the Consolidated Water Power and Paper Company indicated it would not make a connection with the interceptor system at Stevens Point. The company plans to provide its own disposal system later, it was said.

Celebrate No-Accident Record

Thirty-two foremen of the Menasha Products division of the Marathon Paper Mills Company held a dinner at Hotel Menasha, Menasha, Wis., last week to celebrate a no-accident record at the plant for the month of June. E. D. Stoetzel, director of industrial relations, and Jack Stevens, assistant general manager, were present from the company's main offices at Rothschild, Wis. Talks were given by these officials and R. J. Sund, Walter E. Strong, and Miss Margaret Powell, nurse in charge of the first aid room.

H. W. Morgan Resigns from Institute

Howard W. Morgan, research associate in charge of pulp and paper testing, and instructor in pulp and paper technology, has resigned from the Institute of Paper Chemistry, Appleton, Wis. He is leaving August 1 to become technical director of the Munising Paper Company, Munising, Mich. He had been on the Institute staff for the last four years, prior to which he was research engineer at the Oxford Paper Company, Rumford, Me. He is chairman of the testing division of the Technical Association of the Pulp and Paper Industry, and for the last year was president of the Lake States section of the association.

David Smith Goes To Ward Paper Co.

David Smith, office manager at the Ashland, Wis., mill of the Marathon Paper Mills Company for six years, and manager of the standards department for the last three years at the main mill at Rothschild, Wis., has resigned. He has been appointed general manager and secretary-treasurer of the Ward Paper Company at Merrill, Wis. The Ward company purchased the former Grandfather Falls Paper Company, revamped the mill, and has been making sulphite bonds.

Gilbert Paper Employees Picnic

Employees of the Gilbert Paper Company, Menasha, Wis., will hold their annual picnic Saturday, August 6, at the Menasha park. Two baseball teams will be organized to put on a challenge game, and there is to be an amateur contest. John Pinkerton is chairman of the arrangements.

Consolidated Reelect Officers

[FROM OUR REGULAR CORRESPONDENT]

WISCONSIN RAPIDS, Wis., August 1, 1938—Officers and directors of the Consolidated Water Power and Paper Company were reelected at the annual meetings at the company's offices here last week. They are: George W. Mead, president; Walter L. Mead, vice-president; Stanton W. Mead, treasurer, and E. B. Redford, secretary. These four, with Theodore W. Brazeau, were retained as directors.

An interesting sidelight of the meeting was the presence of four stockholders who were among the founders of Consolidated more than four decades ago. They are President Mead, George M. Hill, 82, J. L. Nash, 88, and E. E. Winch, 91.

The Consolidated company filed an application July 27 with the Wisconsin Public Service Commission at Madison, Wis., for permission to construct five dams on the Wisconsin River at the Marathon portage in Juneau and Adams counties.

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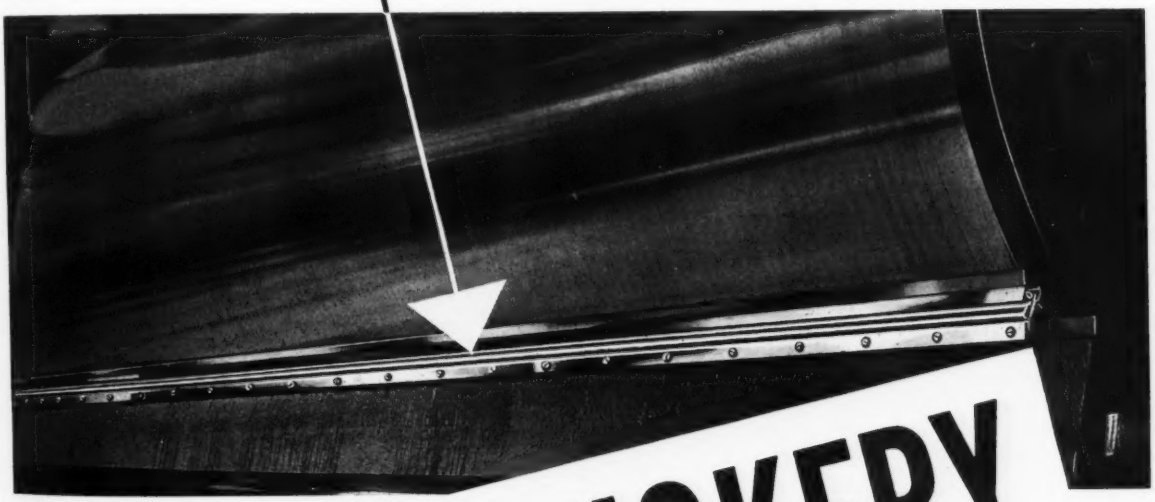

VICKERY DOCTORS

Indianapolis Demand Improves

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., August 1, 1938—With the worst of the summer season over, there has been a gradual expansion in the paper business during the last week, according to local jobbers and manufacturers. The expansion has not been large, but since it virtually is the first that has been very noticeable, it has restored confidence to some extent. Improved conditions were noticeable in virtually every line in the market. Jobbers say there is a better feeling among the consumers of paper, who have been inclined to increase their stocks in the face of a better economic condition.

Demand for newsprint shows about the same volume as prevailed a year ago. There is no lack of normal demand from the rural papers, but in some instances the larger city papers have had to curtail their consumption. In some industrial cities where the largest payrolls have been cut in half and even more, the advertisers cut their lineage and this had some effect. However, it is hoped this is but a temporary condition that fall will remedy.

The box industry has been hit to some extent, but there are signs of improvement. Makers of beer cases have been fairly busy. The container trade, which also has been down for some time, is improving. Business with the ice cream trade has picked up materially during the last fortnight due to the first really hot weather of the year. Prices are being held.

Building papers now are much in demand after a slow start early in the summer. The volume of building during the last month has exceeded that of the same month last year by nearly fifty per cent, which is encouraging. Jobbers say the dealers are predicting a good fall and are increasing their stocks.

A slight improvement also was seen in demand for paper stock and rags. The general tone of the market is none too strong, but prices are quoted a trifle higher than they have been.

Savannah to Hold Paper Festival

Organization plans for a paper festival to be held in Savannah, Ga., next spring and annually thereafter were effected recently at the first formal meeting of representative citizens interested in the movement at the Chamber of Commerce. Upon motion of William Murphey, president of the Citizens and Southern National Bank and one of the outstandingly influential leaders in bringing the paper industry to this section, the assembled interests went on record as favoring the plan to stage the festival and empowered the Chamber of Commerce to work out preliminary plans in a manner which will win co-operation of other cities of the South.

It was repeatedly emphasized by those outlining plans for the pine products festival that the celebration is visualized as one of a Southwide interest. The sentiment of the meeting was, in fact, so thoroughly in favor of minimizing the local interests that some expression was voiced against having a local man appointed head of the committee, but several representatives spoke in favor of Herschel V. Jenkins as chairman. The question also arose as to the advisability of Savannah taking the lead and automatically adopting the position of capital of the paper industry. J. H. Allen, executive vice president of the Union Bag and Paper Corporation took the position Savannah already has this leadership. He stressed the many reasons why Savannah rightfully was entitled to this position. Mr. Allen outlined the lead Savannah has taken in Southern industry throughout the ascendancy of cotton, of naval stores, and of numerous other interests, declaring that with the new order, Savannah should now take the lead, as is her heritage in the pine products industry.

Preliminary plans for the celebration here embrace a three-day gala program, the climax of which will probably be a ball, with the probability of a crowned king and queen. There will be numerous spectacular events such as a float parade and carnival features, and an accompanying program of educational and exhibition value. Not only are paper industry interests expected to participate but a large number of allied interests, such as manufacturers, forestry organizations and leading co-operative interests of the industrial South.

A. Cooper Buys Sherman Mill

[FROM OUR REGULAR CORRESPONDENT]

GREAT BEND, N. Y., August 1, 1938—Announcement is made here of the sale of the mills of the bankrupt Sherman Paper Company to Abe Cooper, prominent business man of Northern New York. The property, consisting of mills at Great Bend, Felts Mills and Lefebre, was recently acquired by the Anderson Land Company from the bankruptcy trustee of the company at public auction. The sale price was not disclosed but it was stated that the sale to Mr. Cooper did not include the water power rights. A few days ago it was reported that the new owner had offered $37,000 for the properties although this was not confirmed. It is also reported that the Central New York Power Corporation has offered $200,000 for the water power rights and some announcement is expected within a short time. It was also learned that Mr. Cooper has several parties interested in the purchase of the paper mill at Felts Mills and will make every effort to dispose of it as an operating project so that former employees can be given work and paper manufactured. Mr. Cooper, however, is expected to salvage the mills at Great Bend and Lefebvre. The mills were purchased by Mrs. E. A. Wise for about $31,000 on a bid which was not opposed by any other parties. The purchase was subject to slightly over $180,000 in mortgages held by Mrs. Wise on the properties. It is reported that James F. Walsh, a paper jobber, has been interested in buying 1,600 tons of paper from the mills providing a satisfactory transaction could be negotiated.

Canada Ships Less Bleached Sulphite

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 3, 1938—Shipments of bleached sulphite pulp from Canada during the first 3 months of 1938 reached a total of only 63,764 short tons as against 93,151 short tons during the corresponding period in 1937. The largest decrease was in exports to the United States which dropped from 81,102 tons one year ago to 37,439 tons during the current year. Exports to the United Kingdom during the same period rose from 6,386 tons to 12,479 tons and to Japan from 2,466 tons to 9,415 tons.

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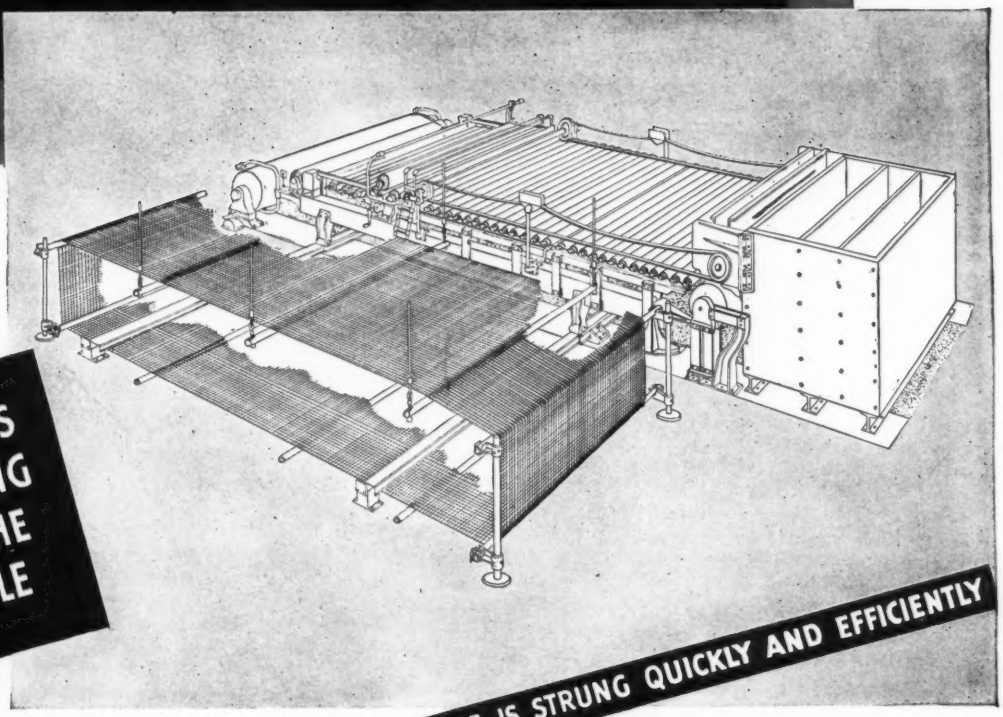

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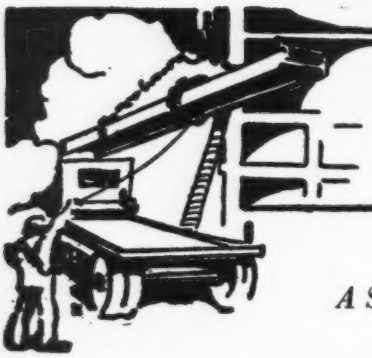

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

Savannah, Ga.—The National Gypsum Company, 190 Delaware avenue, Buffalo, N. Y., manufacturer of wall board, insulating board and allied products, has awarded general contract to the George A. Fuller Company, 597 Madison avenue, New York, N. Y., for new mill in Port Wentworth district, Savannah, where large tract of waterfront property recently was acquired, as previously noted in these columns. New plant will be used for wall board production and will consist of a group of one and multi-story buildings, with power house, pumping station and other mechanical units. Project will also include the dredging of waterfront area near mill site, and the construction of wharves and docks for water shipping facilities, and work on these structures will begin early in August. Actual mill erection is scheduled to begin in September, with completion early in 1939. Entire project is estimated to cost about $1,000,000 and financing has been arranged through a recent bond issue of $3,500,000. The Fuller company, noted, also will be in charge of engineering work in connection with building design and erection. This is the second mill to be constructed in the South by the company in recent months, a new plant for the production of fiber insulating board having recently been completed at Mobile, Ala., and now placed in regular operation. G. H. Tarbell is vice-president and production manager.

Long Island City, New York—Board Fabricators, Inc., 36-11 33rd street, manufacturer of box board products, etc., has leased a local one-story industrial building at 43-06 Thirty-sixth street, and will occupy for plant service. Structure will be taken over at once.

Kissimmee, Fla.—The Tropical Fibre Company, Auburndale, Fla., manufacturer of fiber products, has taken over a tract of about 10 acres of land on Oak street, near Bermuda avenue, Kissimmee, and will occupy for plant. Present works will be removed to new location at once and increased capacity carried out.

Elizabeth, N. J.—Peter J. Schweitzer, Inc., 994 Newark avenue, manufacturer of carbon papers and other processed paper stocks, has taken out a permit for new addition to mill at Newark avenue and Virginia street, and will proceed with superstructure immediately, pushing unit to early completion. It will be one-story, used for increased plant operations. Cost is estimated close to $35,000, including equipment.

Rochester, N. Y.—The Eastman Kodak Company, Kodak Park, manufacturer of special processed papers, films and other materials, has approved plans for new addition to plant, to be one-story, estimated to cost close to $60,000, with equipment. Contract for general erection has been let to the Ridge Construction Corporation, Kodak Park, and work will be placed under way at once.

New York, N. Y.—The Crown Container Corporation, recently organized with capital of $20,000, plans operation of plant in the Bronx for manufacture of paper boxes and containers of various kinds. New company is represented by Stillerman & Stillerman, 55 West Forty-second street, New York, attorneys.

Houston, Tex.—The Bemis Brother Bag Company, 601 South Fourth street, St. Louis, Mo., manufacturer of paper bags and containers, has awarded general erection contract to the T. Hubbard Construction Company, 1507 Delano street, Houston, for proposed new addition to branch plant at 2002 Lyons avenue, Houston, previously referred to in these columns. New structure will be two-story and basement, about 80 x 92 feet, and will cost close to $50,000, with equipment. Superstructure will be placed in progress at early date.

Windsor, Ont.—The National Automotive Fibres, Inc., 19925 Hoover avenue, Detroit, Mich., manufacturer of fiber products for automobile service, etc., has arranged for the purchase of a large one-story industrial plant at Windsor, heretofore held by the Ford Motor Company of Canada, Ltd., and will occupy for a new Canadian branch factory. Improvements will be made and equipment installed at once. Facilities will be provided for about 250 employes. It is expected to have the plant ready for production in August. Output will be used to supply different automobile plants in Canada.

Prince Rupert, B. C.—The Prince Rupert Lumber, Pulp and Paper Mills, Ltd., Prince Rupert, has plans under way for large sulphate pulp mill on site near city, to consist of several one and multi-story units, with power plant, pumping station, machine shop and other mechanical departments. It is reported to cost close to $1,000,000, with equipment. Work is scheduled to begin early in the fall.

London, Ont.—The London Roofing Products, Inc., Trafalger street, manufacturer of prepared roofing materials, has begun superstructure for new one-story and basement plant on local site, for which erection contract recently was awarded to W. C. Northey, 373 Worthey street, London, as previously noted in these columns, and will push work to early

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SEPTEMBER 8-9-10

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completion. New unit will be 50 x 150 feet, and is estimated to cost close to $100,000, with machinery. Contracts are being placed for necessary equipment.

New Companies

New York, N. Y.—The Ryan Paper Corporation has been incorporated with capital of 100 shares of stock, no par value, to deal in paper products of various kinds. New company is represented by H. W. Sobell, 25 West Forty-third street, New York, attorney.

Salem, Mass.—The Cassino Card Company, Inc., 144 Washington street, has been organized with capital of $50,000, to manufacture and deal in paper and paper card stocks of different kinds. Harold L. Cassino, 20 Naples road, Salem, is president; and Hayward W. Adams, 25 Austin street, Milton, Mass., treasurer.

Burlington, Wis.—The Special Machines Corporation has been organized to manufacture and deal in machinery for paper mills. The incorporators include Walter Dinkel, J. F. Hanson and Wallace Newbury, all of Burlington.

New York, N. Y.—Sandwich Holders, Inc., has been chartered to manufacture and deal in paper boxes and containers for food products, and other paper cartons. New company is represented by Nathan Mandel, 349 East 149th street, Bronx, New York, attorney.

Malden, Mass.—The Malden Paper and Metal Company, 154 Willow street, has filed notice of organization to deal in waste paper products, etc. New company is headed by William Segal, 113 Malden street, Malden.

TAPPI Notes

Norman Clark, formerly with the International Printing Ink Company, is now with Ault & Wiborg, Cincinnati, Ohio.

Howard Morgan, recently instructor at the Institute of Paper Chemistry, is now technical director for Munising Paper Company, Munising, Mich.

Correction: In TAPPI Standard O 401 p-37 in item 61 on sheet 2 the small type should read (Item 59) x (Item 60) instead of (Item 61) x (Item 62).

Reservations for hotel accommodations at Green Bay, Wis., Sept. 8-10, 1938, TAPPI Fall Convention should be made with N. L. Malcove, Northern Paper Mills, Green Bay, Wis., and program advertising and exhibit reservations with R. D. Cords of the same company.

The following TAPPI division chairmen have been appointed: Industrial Division: B. M. Thomas, Container Corporation of America, Manayunk, Pa.; Engineering Division: W. G. MacNaughton, News Print Service Bureau, New York, N. Y.; Testing Division: H. W. Morgan, Munising Paper Company, Munising, Mich.; Pulp Manufacture Division: W. F. Gillespie, Gaylord Container Corporation, Bogalusa, La.; Paper Manufacture Division: G. Lamont Bidwell, Jr., Riegel Paper Corporation, Riegelsville, N. J.; Research Development Division: C. E. Curran, Forest Products Laboratory, Madison, Wis.; Converting and Consuming Division: A. W. Nickerson, 542 Fifth avenue, New York.

Members of TAPPI desiring to serve on any committees should notify the Secretary as soon as possible.

L. F. Johnson Goes to Gummed Products

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., August 1, 1938—Lee F. Johnson, recently in charge of the Wrapping Paper Division of the D. L. Ward Company of Philadelphia, goes with the Gummed Products Company of Troy, Ohio, as mill representative in this territory. Mr. Johnson is well and favorably known in the trade here, having been prominently identified with the Paper Trade Association of Philadelphia, the Philadelphia Paper and Cordage Association, and treasurer of the Dollars & Sense Club.

Mr. Johnson formerly was engaged in laboratory

LEE F. JOHNSON

work for eleven years with the Peerless Paper Company, Dayton, Ohio. From 1929 to 1932 he was connected with the fine paper division of Whiting-Patterson Company, after which he went with D. L. Ward Company, in charge of the industrial division of their wrapping paper.

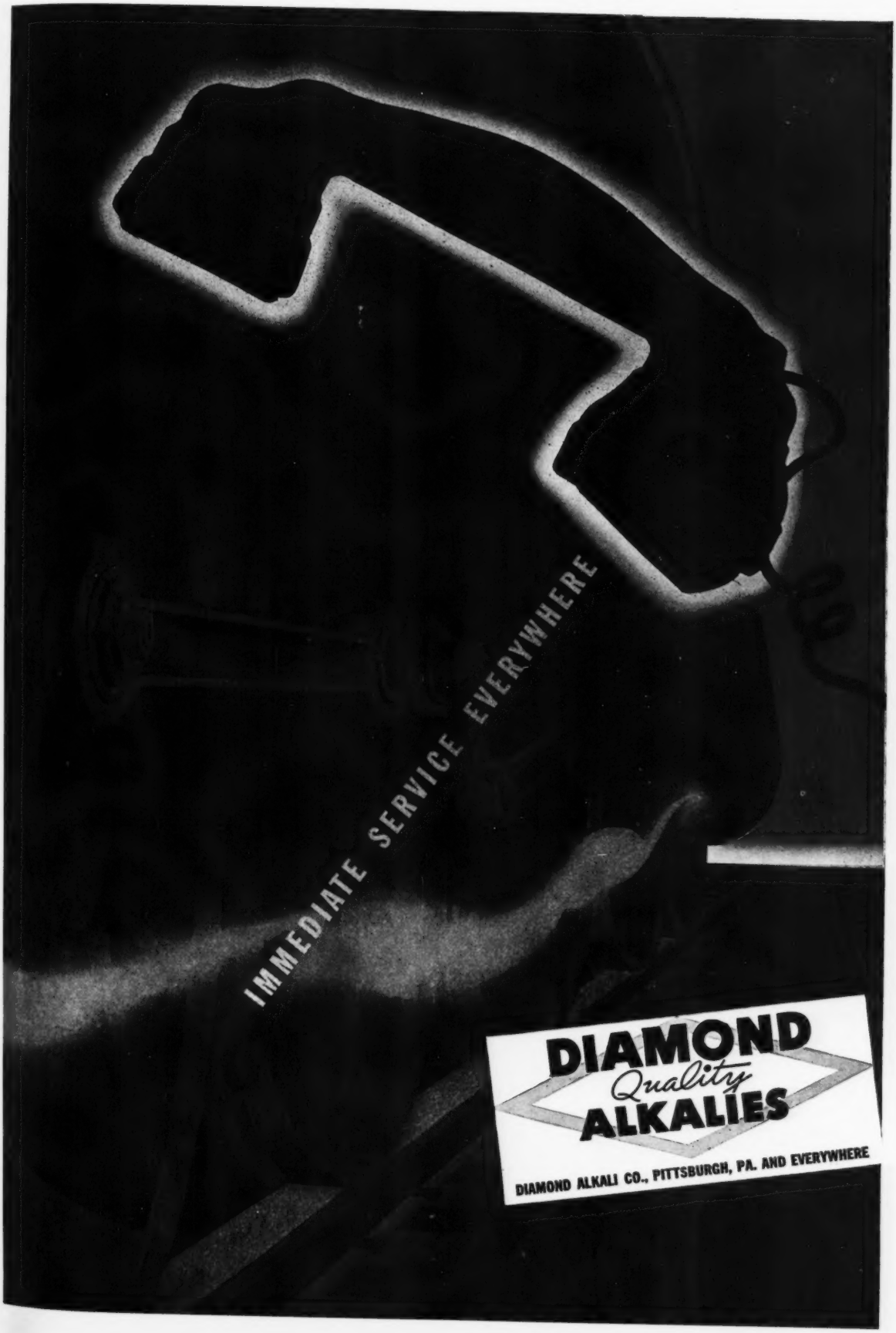
Abitibi Reorganization Still Pending

TORONTO, Ont., August 1, 1938—It is reported that efforts to bring about a reorganization of the Abitibi Power and Paper Company, Limited, Toronto, are at a standstill for the moment. The bondholders' representative committee, known as the Ripley committee, has until the middle of September to enter a further application following its reversal in the Ontario Court of Appeals. It is understood that this committee has not decided yet what its action will be.

D. C. Everest Heads Ward Paper Co.

D. C. Everest, who was associated with J. M. Ward, in starting the Ward Paper Company at Merrill, Wis., has taken over all of Mr. Ward's interests and has assumed the presidency of the company as of July 16. Mr. Everest will direct the company from now on.

J. M. Ward, the original president of the company, states that his plans at this time are incomplete but that it is his intention to remain in the paper business.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COMING EVENTS IN THE PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Fall meeting, Northland Hotel, Green Bay, Wis., September 8-10.

NATIONAL PAPER TRADE ASSOCIATION. Fall convention, Stevens Hotel, Chicago, Ill., September 19-21.

INDUSTRIAL PRICE-FIXING

A study of this country's economic system or monopoly inquiries will soon begin with the Federal Government making an attempt to first discipline the motion picture industry and give the people an education in new anti-trust law technique. This initial effort will be followed by other inquiries, all of which is reminiscent of the "big stick" which Theodore Roosevelt once flourished, but with this difference, that the present inquiry is termed a co-operative investigation by Government spokesmen. In an address before the Merchants and Manufacturers' Club at Chicago on July 6th, Richard C. Patterson, Jr., Assistant Secretary of Commerce said in part: "The investigation of business practices to be made by the National Economic Committee will not be a witch-burning expedition. The investigation is to be made to obtain a complete, accurate picture of those industries in which competition is really effective. We are interested also in studying those industries where competition is not effective and finding out why it is not. How far is competition ineffective because of the patent situation; limited natural resources; or because of concentration of control. Only by knowing to what extent these factors affect business can we take steps to make our economic system operate smoothly and effectively and provide a steadily increased standard of living."

This is one of the most important activities of the Federal Government now getting under way and about which very little is apparently generally known. Popularly called the "anti-monopoly committee", the National Economic Committee is a joint committee of Congress and of the executive departments. Its actual purpose is to study the country's entire economic system, such as was begun in June 1898 when Congress created the United States Industrial Commission with power to investigate American business and finance. That commission was composed of five Senators, five Representatives and nine other individuals appointed by the President. An annual appropriation was made available and the Commission, like the present Committee, could draw on Government departments for help. The study was completed in four years and its report is contained in eighteen volumes. It furnished the basis for much of the reform legislation in the early 1900's and its influence continues today. This early report was the start of a period of active legislation against big business, leading to the creation of the Bureau of Corporations, which evolved into the Federal Trade Commission.

There are now unmistakable signs that the Federal Government under the New Deal socialization plan, will continue to attempt to establish new and more drastic controls over business, and the inquiry of 1938 may possibly lead to the adoption of a proposition similar to that mentioned, but not adopted, by the Commission created in 1898, which said in part: "There is logically no reason why, if Government operation is desirable as to railroads and natural monopolies, it should not be made to apply to monopolies coming from patents, or to capitalistic monopolies whose chief advantage is that of great capital shrewdly handled. The practical difficulty in such case is connected with the question whether the Government itself is likely to manage such business in the interest of the people, or whether the public will demand such action."

As the National Economic Committee is about to begin its $500,000 study to ascertain price controls and price policies in industry, the Brookings Institution has published a study of its own in that field, in a book "Industrial Price Policies and Economic Progress", written by Edwin G. Nourse, director of the Brookings Institution's Institute of Economics, assisted by Horace B. Drury of the Institute's staff. This study concludes that while methods of industrial price fixing have greatly changed since the days when most prices were fixed by direct bargaining, this change has not brought a net decline in competition. The study points out that efforts to maintain artificially high prices under modern competitive conditions have little chance of success over a period of years, and the price-fixing power of so-called monopolies have clearly diminished.

In conclusion the Brookings study states in part: "With the growth of a more complex industrial system, there is less of individual enterprise and more concentration in the hands of corporate offi-

cials. If they are to be safe custodians of our national prosperity under a system which gives them large freedom in developing these great enterprises, they must accept the responsibility of so conducting the system that the great mass of those no longer in a position of self-employment shall still have access to jobs through which they may meet their needs up to the maximum made possible by our rich resources and advancing techniques. A sound pricing system is one which develops capacity operation, and this implies employment of the nation's full labor force.

"If the American business man demands the right of freedom of economic enterprise, society in granting it to him may properly ask that he uses that freedom aggressively in the public interest. This, to our way of thinking, is the challenge which the industrial system makes to the industrial executive. If he cannot meet it, the system of free enterprise under private capitalism is doomed to a condition of low vitality and unproductiveness which is utterly incompatible with the natural resources, productive equipment, and man power which the nation has at its disposal.

The conclusion of the Brookings study is that price administration will continue and that planning is essential. In the opinion of others the probable effect of the National Economic Committee study will lead to Federal incorporation of all enterprises engaged in interstate business, with the Federal Government taking some part in the dictation of the corporation's policies. The attempt to enact a Federal licensing bill, known as the O'Mahoney-Borah Licensing Bill, failed but in the New Deal plans for acquiring political control of all important business enterprises, and this is an important feature in the New Deal philosophy for a more abundant life, a controlled economy is essential. As the National Economic Committee is approved by Senator O'Mahoney, it is doubtless the hope of the Administration to eventually impose more drastic political control over all interstate business enterprises.

Erect Fountain at Howard Mill

Visitors to the Howard Paper Company, Urbana, Ohio, find an institution of modern efficiency, located on a beautiful site.

To enhance the beautiful lawn surrounding the mill and office, a marble fountain, imported from Italy several years ago by members of the Howard family, has been placed on the grounds. Through this fountain flows the cool and refreshing water for which the location is noted, and this water is responsible for the reputation that Howard Bond has gained as "the World's Whitest Bond Paper" —for, it is so pure that it goes directly into the manufacture of the paper without treatment. Anyone who has the opportunity to see this model paper mill and the surrounding grounds ought not to miss it.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Months	1938(c)	1937(c)	1936	1935	1934
January	63.9%	90.3%	76.1%	65.8%	.....
February	68.7%	90.1%	77.9%	70.0%	.....
March	69.6%	90.3%	76.0%	70.5%	.....
April	68.3%	92.1%	82.3%	70.0%	.....
May	69.0%	90.6%	81.6%	69.4%	.....
June	65.9%	87.3%	80.7%	72.3%	.....
July	.....	81.8%	77.3%	64.9%	.....
August	.....	82.9%	81.5%	70.9%	.....
September	.....	78.6%	80.5%	71.9%	58.2%
October	.....	73.5%	87.6%	75.6%	64.7%
November	.....	61.9%	88.0%	75.3%	61.7%
December	.....	54.5%	85.9%	71.2%	59.6%
Year Average	.....	80.6%	81.3%	70.5%	.....
First 29 weeks	67.7%	89.1%	78.7%	68.9%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1938		CORRESPONDING WEEKS, 1937	
*June 18	66.1%	June 19	89.2%
*June 25	67.6%	June 26	88.6%
*July 2	68.7%	July 3	85.2%
*July 9	58.3%	July 10	69.8%
*July 16	75.9%	July 17	87.6%
*July 23	75.4%	July 24	85.9%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting, Current Weeks					
Ratio Limits	June 18, 1938	June 25, 1938	July 2, 1938	July 9, 1938	July 16, 1938	July 23, 1938
0% to 50%	112	98	108	128	77	57
51% to 100%	195	206	196	174	202	147
Total Mills Reporting	307	304	304	302	279	204

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

Mos.	1938 (e)	1937 (e)	1936	1935	Mos.	1938 (e)	1937 (e)	1936	1935
Jan.	55%	80%	61%	61%	July	....	67%	69%	59%
Feb.	61%	86%	67%	67%	Aug.	....	74%	75%	65%
Mar.	60%	87%	68%	67%	Sept.	....	70%	76%	69%
Apr.	57%	89%	70%	61%	Oct.	....	66%	82%	76%
May	58%	86%	68%	61%	Nov.	....	56%	79%	70%
June	56%	75%	68%	65%	Dec.	....	46%	74%	60%

Week end. June 18, 1938—53%
Week end. June 25, 1938—59%
Week end. July 2, 1938—62%
Week end. July 9, 1938—37%
Week end. July 16, 1938—60%
Week end. July 23, 1938—65%

(e) Basic figures revised to include new members of the National Paperboard Assn.

Hires Dog To Catch Rats in Straw Pile

"At Circleville, Ohio", says *Life* in its issue of July 25, 1938, "the Container Corporation of America operated a straw board mill. In its storage yard are stacked great bales of wheat straw. Between the bales dwell thousands of mice and rats which feed on grains left by the thresher. Gradually they migrate to lower levels as the straw is carted away. When the last bales are removed they swarm forth in hordes. Until two years ago the mill operators could find few men willing to move the final bales because the rats ran up their legs and scared them.

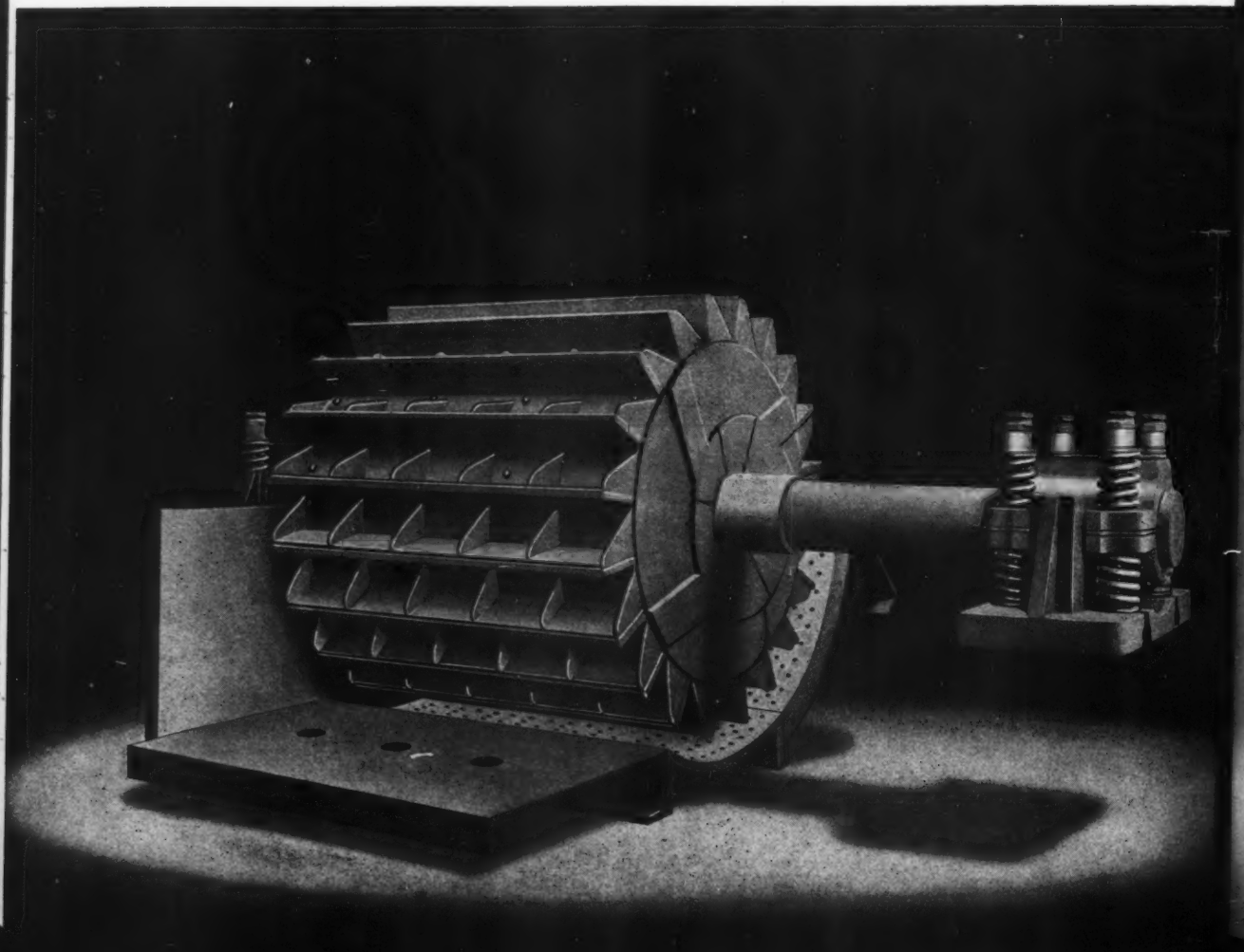
"One day as workers gingerly shifted bottom bales, Fanny, a homeless German shepherd, wandered in, began catching rats for fun. So efficient was she that Container Corporation bought her a license, had her spayed, gave her permanent board and lodging. The company claims she is the only dog regularly engaged in modern industry. Her record catch is 142 rats in one day." Two pages in this issue of *Life* are devoted to pictures of Fanny.

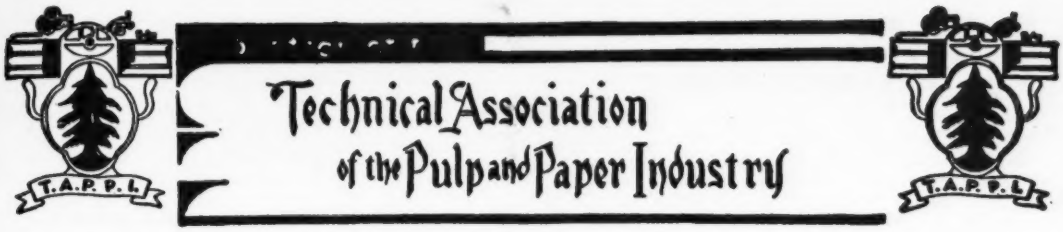
Dilts

- **BREAKER BEATERS**—A Dilts built unit for continuous or batch operation.
- **OPERATING ECONOMY**—Trash-free spindles assure low power consumption while rugged construction gives continuous trouble-free operation.
- **BREAKER SYSTEMS**—The Dilts Breaker Beater can effect economies and increased production in your present system. However, in the Dilts Breaker Beater method of pulping, the increase will be much greater and at the same time show a substantial saving in power consumption.

Our able engineering staff will gladly consult with you on your individual requirements without obligation to you. Write for details.

DILTS MACHINE WORKS, INC., FULTON, N. Y.





Edited by Ronald G. Macdonald, Secretary

Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Machinery

Paper Winding Machine. Jacob F. Albright. U.S. pat. 2,095,516 (Oct. 12, 1937).—The invention provides a snap-on collar for winder shafts comprising a unitary U-shaped housing with an open throat slightly wider than the diameter of the winding shaft and of such a length that the ends of the throat extend beyond the surface of the shaft as a whole. The collar may be placed on the shaft while the latter is in motion, and is automatically locked on the shaft. (Cl. 287-52).—A.P.-C.

Sectional Electric Paper Machine Drive. A Recent Installation at the Facture (Gironde) Plant of La Cellulose Du Pin. M. P. Wodey. Papier 40: 665-679, 755-766, 843-857 (Aug.-Oct., 1937).—The requirements which should be met by a modern sectional electric paper machine drive are indicated, and the drive as constructed by the Société Als. Thom, Belfort, and installed in the Facture mill of La Cellulose du Pin is described in detail.—A.P.-C.

Supplying Pulp to Paper Making Machines. Samuel Milne. Brit. pat. 469,203 (July 21, 1937).—In a flow or breast box of a fourdrinier or cylinder machine pulp flows, e.g., vertically, from an inlet through successively branched pipes or apertured paths to a single final outlet at the breast board, to all parts of which the resistance to flow is the same.—A.P.-C.

Paper Machine Rolls. Robert J. Wilkie, assignor to Stowe-Woodward, Inc. Brit. pat. 468,482 (July 6, 1937).—A light and rigid roll consists of an inner tube of brass, steel, aluminum, etc., with inwardly depressed strengthening ribs extending substantially the length of the roll and spaced widely apart and an outer shell of rubber, brass, etc., which may have projections engaging the depressions.—A.P.-C.

Breast Boxes of Paper Machines. Oscar Rolls. Brit. pat. 469,229 (July 21, 1937).—Fiber clusters, etc., are skimmed from the surface of pulp by a hopper extending completely across the last section of the breast box of the paper machine.—A.P.-C.

Paper Machine Head Box. S. Milne. Belg. pat. 420,628 (April 30, 1937).—A number of baffles are provided between the inlet and outlet of the head box, that divide the stock into separate currents of equal length and volume.—A.P.-C.

Vacuum Washers vs. Diffusers. H. A. Morrison. PAPER TRADE J. 105, No. 27: 46-48 (Dec. 30, 1937).—Multiple-stage vacuum filters, so designed that air is not intimately mixed with black liquor, are established as commercially superior to diffusers for washing Southern kraft pulp. The filter washing system requires careful planning at every point. Such a system excels diffusers in all particulars.—A.P.-C.

Power

Paper Board Mill Saves $600 a Day on Power. Edward R. Feicht. Paper Industry 19: 1062-1067 (Dec., 1937).—The story of power in the plant of the Container Corp. of America, Manayunk, Philadelphia, Pa., with a description of the present plant, showing how the modernization initiated in 1934 has resulted in a saving of $600 per day.—A.P.-C.

Paper Mill Uses Three Kinds of Power. A. W. Loomis. Compressed Air Mag. 42:5391-5395 (Aug., 1937); B. I. P. C. 8:179. The Hinsdale Paper Manufacturing Co. is unique in that it combines water, steam, and Diesel power, the latter to be used for deficiencies in water power during the summer months when the stream flow is low. An illustrated description of the system is given.—C.J.W.

Forced Circulation Boilers. A. Watzinger. Finnish Paper and Timber J. 19, No. 20:849-850; No. 21:888-890, 892, 894-896 (Oct. 31, Nov. 15, 1937); B. I. P. C. 8:179. The author describes three representatives of forced circulation boilers, the Benson, La Mont, and Velox boilers. Their chief advantage is lower price on account of reduced floor space and less weight, while operating safety and heat utilization are the same as for the larger and older types of high pressure boilers.—C.J.W.

Miscellaneous

Opening Address of the "Technical Week" of the Paper Industry, 1937. Magnus Christiansen. Papir-J. 25, No. 24:381-383 (Dec. 31, 1937); B. I. P. C. 8:218.—The activities of the Norwegian paper research institute for 1937 are reviewed. Due to an enlargement of the buildings the program of 1937

could not always be carried out as planned; the studies made include investigations of bleaching, cooking and grinding experiments with different wood species, pulp stones, fungi, pitch troubles, newsprint quality from the viewpoint of printability, sulphite studies, and sizing problems. A similar program will be carried out in 1938. Courses for paper-mill engineers are also planned.—C.J.W.

Fifteen Paper Companies. Fortune 16, no. 5: 132-9, 189-90, 192, 194, 196, 199 (November, 1937). Detailed histories and financial analyses are given for fifteen paper companies, some of which have been unlucky, some foolish, and seven prosperous. They are: Robert Gair Co., Brown Paper Mill Co., Taggart Corporation, Abitibi Paper and Power Co., Ltd., Price Bros. and Co., Ltd., American Writing Paper Co., Mead Corporation, Consolidated Water Power and Paper Co., West Virginia Pulp and Paper Co., Great Northern Paper Co., Marathon Paper Mills Co., Kimberly-Clark Corporation, International Cellucotton Products Co., Scott Paper Co., and Hammermill Paper Co. In addition there are shorter accounts of New York and Pennsylvania Co., Crocker-Burbank and Co., Castanea Paper Co., Oxford Paper Co., S. D. Warren Co., Crown-Zellerbach Corporation, and Sutherland Paper Co. Business charts show the financial records of the newsprint, book paper, wrapping, and paperboard divisions. The problems of overproduction and lack of price structure control are again emphasized.—C.J.W.

International Paper and Power. Fortune 16, no. 6: 130-6, 226, 229, 230-2 (December, 1937.) International is the world's largest paper company, with one of the most complicated corporate structures of the industrial world. It is peculiarly representative of all paper, with all kinds of paper, and power in its operations. It has had all the normal difficulties of the industry and some special ones. This article traces the physical and financial growth up to 1924, to February, 1936, under Archibald Graustein, and since then under Richard Cullen. The southern kraft development, the machine modernization program, the scrapping of obsolescent mills, and the simplification of executive control are credited to Cullen. The financial reorganization plan as approved last spring has paved the way to payment of the first dividends since 1930, and the future looks bright. —C.J.W.

Problems Relative to Sanitation and Working Conditions in the Impregnated Roofing Felt and "Ruberoid" Industry. S. M. Brodskii, F. N. Grinchar, B. A. Rakhmanov and M. M. Tomarov. Hig. Truda 14, No. 5: 41-43 (1936); Chimie & Industrie 38: 686 (Oct., 1937).—In the production of roofing felt and "ruberoid", vapors of volatile products contained in the tar, pitch and bitumen used for impregnating are given off into the air, which may contain 0.03 to 0.093 mg. of hydrocarbons per l. Presence of these products in the atmosphere and direct contact of the workmen with the impregnating agents and with the finished products produce numerous skin diseases due to the photodynamic and cancerigenic properties of the substances. The only truly effective method of overcoming these hazards is to carry out the whole process in hermetically sealed equipment and to eliminate all direct handling.

Paper Defects, Their Causes, Control and Cure. Murray M. Rubin. Paper Industry 19: 796-798 (Oct. 1937).—A general discussion.—A.P.-C.

Metallic Dendrites in Paper. Murray M. Rubin and Walter R. Rubin. Paper Industry 19: 1155-1162 (Jan., 1938).—A description in some detail of the general principles of the science of papyro-pathology in the solution of a paper defect, its cause and cure, outlining the influence of raw materials, equipment and process of pulp and paper manufacture on chemical and metallic residues in the finished product, and tracing the effect of interaction of such residues by means of photomicrographs of dendritic growths and microchemical methods of analysis.—A.P.-C.

Asbestos. M. Déribéré. Papeterie 59: 957-962 998-1005 (Oct. 25, Nov. 10, 1937).—A general description of its properties and uses in the paper industry.—A.P.-C.

Nickel Alloys in the Pulp and Paper Industry. Anon. Papeterie 59: 906-922 (Oct. 10, 1937).—A brief description of the principal nickel alloys and of their applications in pulp and paper making.—A.P.-C.

Physics in the Paper Industry. E. W. Samson. J. Appl. Physics 8: 455-461 (1937).—A review of of some unsolved physical problems encountered in the manufacture of paper.—A.P.-C.

Improvements in the Manufacture of Chemical Pulps. Gösta Hali. Mon. Papeterie Belge 17: 387-432 (June-July 1937); Papier 40: 563-572, 649-663, 737-752 (July, Aug., Sept., 1937).—An address describing recent improvements and developments in the Swedish chemical pulp industry.—A.P.-C.

Microbiological Control in the Manufacture of Paper Wraps and Containers for Foods. J. R. Sanborn. Ind. Eng. Chem. 29: 949-951 (Aug., 1937).—Bacteria and moulds causing trouble in a number of plants are specified. Control depends on the provision of a sterile process-water after removal of slime accumulations with acqueous chlorine and (or) copper sulphate. It should be possible to reduce the number of viable spores in the newly-made sheet to less than 100 per g. of paper.—A.P.-C.

Roots-Connersville Joins TAPPI

The Roots-Connersville Blower Corporation, Connersville, Ind., has become a member of the Technical Association of the Pulp and Paper Industry.

The present company is a combination of the P. H. and F. M. Roots Company, the Connersville Blower Company, both of Connersville, and the Wilbraham-Green Company of Pottstown, Pa.

The positive displacement principle now used in their blowers and vacuum pumps was first built by the Roots Company in 1854 and has been carried by the present organization and its predecessor companies.

Vacuum required by the first suction roll applied for paper mill service was furnished by one of their cycloidal pumps. These pumps are now used in the paper industry for flat boxes, suction couch rolls, press rolls and felt conditioners.

Gas pumps of this type are used for handling SO_2 gas, CO_2 gas and other gases in the preparation and treatment of pulp and paper. The blowers are used in various applications in paper mills where pressures from 8 oz. to 25 pounds are required. The vacuum pumps are built in capacities from 50 to 10,000 cubic feet per minute and for vacuums up to 26 inches of mercury.

The Roots-Connersville Blower Corporation will be represented in the Technical Association by B. C. O'Brien, vice-president.

NAF Circulation Apparatus for Sulphite and Sulphate Pulp Digesters*

By Torsten Samson[1]

The object of forced circulation in pulp digesters is to make the pulp uniform. Completely uniform pulp cannot be produced, but the difference between the qualities of pulp produced in different parts of a digester may be kept within a reasonable limit. The differences are influenced by the amount of liquor circulated per minute and by the arrangement of the circulation apparatus. The determination of the circulation requirements may thus be considered as a tolerance problem of a kind similar to the tolerance problems in the mechanical industries. The matter is, however, not quite so simple, because the apparatus for heating the digesters are as a rule connected with the circulation apparatus, and there are consequently two pieces of apparatus, which have to be dimensioned and arranged in relation to the digester and also in relation to each other.

In this country the questions relating to circulation have been treated in a practical way. It may, therefore, be opportune for me to present some theoretical concepts.

Circulation and Heating

From the theoretical standpoint we may assume a circulation apparatus arranged according to Fig. 1, and for our calculation we may assume that the liquid flowing into the digester is mixed immediately with the whole digester content.

The heat carried by the steam to the heater is used for heating the circulating liquor, and this liquor carries exactly the same amount of heat to the digester, if we neglect the heat losses, which are small in comparison with the main heat quantities. If the specific heat of the liquor is 1.0 (which is practically the case) the amount of circulation per hour multiplied by the temperature rise of the liquor in the heater is equal to the heat value of the digester per degree C. multiplied by the temperature rise of the digester per hour.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 21-24, 1938.

[1] Member TAPPI, Consulting Engineer, Stockholm, Sweden.

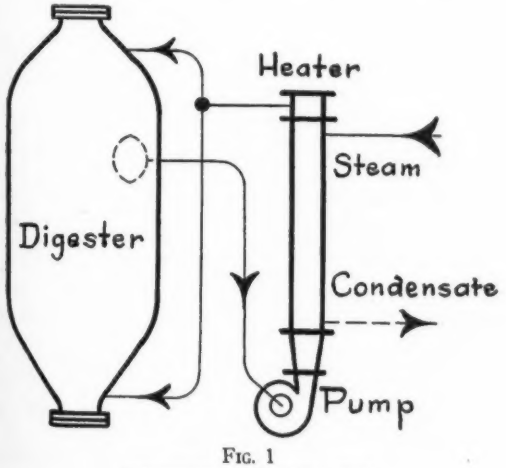


FIG. 1
Arrangement of circulation plant.

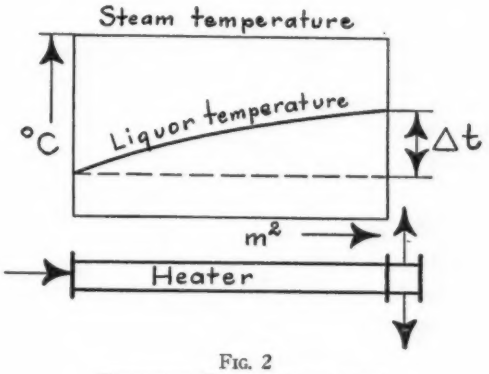


FIG. 2
Temperature differences in the heater.

Thus if Q = circulation in liters per hour,
Δt = temperature rise of the circulating liquor in the heater in deg. C,
a = heat value of the digester with its content in calories per deg. C,
θ = time in hours,
$\frac{dt}{d\theta}$ = temperature rise of the digester in deg. C. per hour

we get

$$Q\Delta t = a\frac{dt}{d\theta} \text{ and } \Delta t = \frac{a}{Q}\frac{dt}{d\theta}.$$

Assume a sulphite pulp digester of 160 cu. m. (5,600 cu. ft.). Then a = 145,000 cal/deg. C. If we circulate 10 cu. in./minute (2,640 gallons/minute), then Q = 600,000 liters/hour, and we get $\frac{a}{Q}$ = about 0.25. For heating say 40 deg. C. per hour the temperature of the acid in the heater rises 10 deg. C. (18 deg. F.). If we increase the circulation, the temperature rises less in the heater. The mean difference between the temperatures of the steam and the liquor is greater, the more we circulate.

We thus see that the amount of heat passing through the heater per unit of time depends not only on the size of the heater, the heat transfer coefficient and the temperature difference at the place where the liquor enters into the heater, but also upon the amount of circulated liquor per minute. This is not so noticeable in the heating of sulphite pulp digesters, as long as normal conditions are prevailing, but should the circulation drop by an appreciable amount, the effect in question will be noticeable. For sulphate digesters the effect is of importance. Thus, for quick heating an ample circulation quantity per minute is indispensable. The reason for this requirement may be formulated as a loss of temper-

ature difference, and for any given circulation quantity per minute this loss is proportional to the temperataure difference at the place where the liquor enters into the heater, as is easily derived from Fig. 2.

The heat transfer coefficient for the heater is dependent on the speed of liquor in the tubes. The coefficient rises considerably with the speed of liquor and, as the speed is proportional to the circulation quantity per minute, we must have a circulation per minute, which does not drop during the heating period, if we want to maintain effective heating.

We have now two good reasons for keeping up the rate of circulation to its top value, as long as the heating lasts. To many it may seem as if this is not quite so, because the main heating is to be done at the beginning of the cook. The matter requires some further consideration.

We may denote by t the digester temperature, by δ the difference between the steam temperature in the heater and the temperature of the liquid at the place where it enters into the heater, and by θ the time in hours. The temperature rise per hour of the digester is proportional to δ, and we have

$$\frac{dt}{d\theta} = b\delta,$$

wherein b is a constant.

Suppose that we have a circulation plant with the circulation and the heater dimensioned so that b = 0.45, that is

$$\frac{dt}{d\theta} = 0.45\delta.$$

At the beginning of the cook, we may have, say 50 deg. C. in the digester, and a steam temperature of 150 deg. C corresponding to a gauge pressure of about 4 kg/sq. cm. (56 lb/sq. in.), may be available. We always measure the temperature of the saturated steam of the given pressure, not the temperature caused by the superheating of the steam, because the main part of the heat is given off at the saturation temperature. The digester is, then, heated at a rate of 0.45 x 100 = 45 deg. C per hour. This is a quick heating for a sulphite pulp digester, and in fact, I have never seen the full temperature difference used in any sulphite pulp mill during the early part of the cook. The same applies to sulphate pulp mills, if the heater is not what I should call too small, which is often the case with plants of old types. At 100 deg. C in the digester, we have an available temperature difference of 50 deg. C, and the digester is heated at a rate of 22.5 deg. C per hour. This heating speed may be utilized. At the end of the cooking time we may have a digester temperature of 135 deg. C. The difference is, then, only 15 deg. C, and this allows a heating speed of

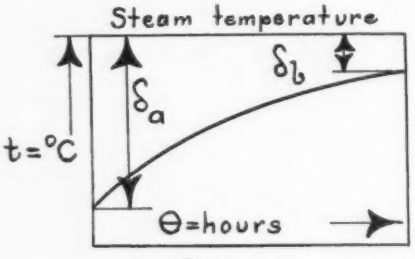


FIG. 3

Heating of digester with constant steam temperature in the heater shell.

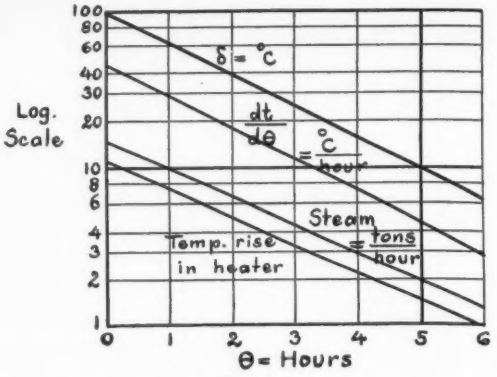


FIG. 4

Heating of digester with constant steam temperature in the heater shell shown with straight lines on semilogarithmic paper.

6.75 deg. C per hour. This is not very much, although it may be considered as being sufficient for most cases. Sometimes, however, one wishes to diminish the temperature difference to a lower figure, say 10 deg. C, and in such a case, one can not get a quick heating. By this simple calculation it is shown that the heater must be dimensioned for the end of the heating and that it is not sufficient to dimension the heater for the requirements at the beginning of the cook, when the digester is relatively cold. The matter is important, and it shows us that we have advantage in keeping up the circulation for the sake of the heating. The advantage of a properly dimensioned heating plant can easily be seen in practice, if one well dimensioned plant is working in the same mill as a plant working with a sinking circulation per minute and possibly also with a heater which is too small. The same thing applies to both sulphite and sulphate pulp cooking.

As I have shown, the heating of a digester follows the equation

$$\frac{dt}{d\theta} = b\delta.$$

An integration of this equation gives, for a constant steam temperature, as t = a constant $- \delta$ and thus $dt = -d\delta$,

$$\theta = \frac{\text{elog } 10}{b} \log \frac{\delta a}{\delta b}$$

where δa = the temperature difference, at the beginning of a heating period,

and δb = the temperature difference, at the end of the same heating period.

This formula gives a straight line on semilogarithmic paper, and we thus get a very simple cooking curve. The heat losses of the digester may be compensated for in the use of the diagram, if we deduct 1 deg. C from the steam temperature. It has been found in practice that the cooking with a constant steam pressure in the heater shell follows the logarithmic line exactly, provided the circulation is maintained at its original value throughout the heating period.

The steam consumption has been found to follow calorific calculations for sulphite pulp digesters. Principally because of the gasing of the digesters the steam consumption per degree C rises during the cook. This may be illustrated nicely on the semilogarithmic diagram by a line which is not parallel

to the temperature difference line. We may complete the diagram by designing one line for the temperature rise of the liquor in the heater and another line for the temperature rise per hour of the digester. The former line is parallel to the steam consumption line, and the latter line is parallel to the temperature difference line. The diagram now shows everything that we want to know for the cooking.

For sulphate pulp digesters similar diagrams may be made, but here the chemical process generates heat, so that, in reality the steam consumption is smaller than the one calculated. This shows itself in that the temperature rises a number of degrees after a quick heating. If the digester is heated slowly, the temperature rise is consumed during the time of heating, and it is then little or not noticeable.

Circulation and Cooking

After this description of the relations between the circulation and the heating I pass over to the relations between the circulation and the cooking. We can not expect to be able to make calculations of the same exactitude as for the heating, but we have, nevertheless, some relations to talk about.

It is acknowledged nowadays that the speed of solution of the non-fibrous matter in the chips is doubled for a temperature rise of 10 deg. C. The temperature of the liquor is the same at the outtakes of the digester as at the inlet of the heater, and the temperature at the inlets of the digester is the same as at the outlets of the heater. Consequently, the maximum temperature difference in the digester is the same as the temperature rise of the liquor in the heater, provided, of course, that there are no dead spaces or eddies in the digester. Let us allow a temperature difference in the digester or a temperature rise in the heater of 4 deg. C at 100 deg. C. It is then reasonable that we allow temperature differences according to the following list:

Degrees C.....	60	70	80	90	100	110	120	130	140
Allowed temperature difference, deg. C.....	64	32	16	8	4	2	1	½	¼

It is seen at once that the allowed temperature differences are not proportional to the speed of heating which we can get. At the beginning of the cook we can allow a great temperature difference, which means a small circulation, and at the end of the heating period we must have a small temperature difference requiring a very large circulation. In fact, at the beginning of the cook we can allow such great temperature differences that we scarcely need any circulation at all for the sake of the pulp. The circulation serves a purpose anyhow, as it equalizes the temperatures of the brick lining, or in the case of sulphate pulp digesters, of the digester shell. The direct cooking without circulation causes big temperature differences on the surface of the lining or of the digester plates, and these temperature differences cause great mechanical stresses, which may result in corrosion. Anyhow, we can see that we cannot be satisfied if we dimension the circulation quantity per minute to satisfy the conditions at the beginning of the cook. *It is at the end of the heating period that the real circulation is required for the benefit of the temperature differences in the digester.*

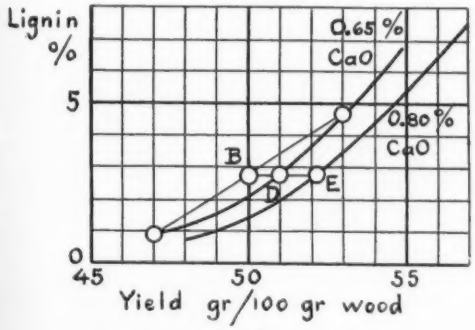


FIG. 5

Professor Hägglund's curves showing how pulp losses occur through uneven cooking.

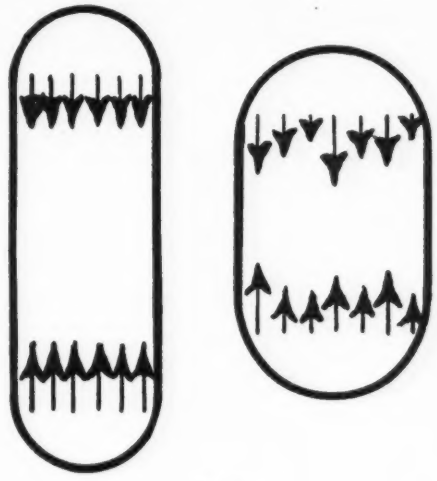


FIG. 6

It is easier to get a good circulation in a long digester with a small diameter, than in a short digester with a large diameter.

It has been much discussed, if circulation is necessary not only during the heating period but also afterwards, when the digester is left at a constant temperature. Those who cannot provide apparatus for the latter purpose claim, of course, that once the fibers are well filled with liquor and once the digester is heated, circulation has no object. I have difficulty in joining such a point of view, because the different fibers are attacked differently, and only by equalizing the liquor composition can one get fibers equally cooked. It must be remembered that the cook stands at the top temperature during a considerable time and that the chemical reaction proceeds quickly at that temperature. I have a support in my assumption from plants working in the same mill, one circulating until the highest temperature is reached and the other until the down gasing is begun. In the latter case, the cooking time is shorter for the same bleachability, and the unbleached pulp is whiter than the pulp from the former plant, which shows that the pulp gets more evenly cooked with a maintained circulation, than if the circulation is stopped at the end of the cook. The whiteness of the pulp is a good means of judging this. *In my opinion, it is at the end of the cook that we need circulation more than at any other time, which we see, if we take all the variables into account.*

I have tried to explain that the diminishing of the tolerances requires an increased circulation and that

the circulation should be maintained to its full extent, until the gasing down is started. This means additional costs for the circulating plants, and these costs must be made up by the better price and the easier selling of better pulp. The production of better pulp does not necessarily mean additional costs.

Fig. 5 shows the lignin content in the pulp as a function of the yield of pulp from the wood according to Professor Hägglund *(1)*. Suppose that half the cook turns out pulp according to point A and that the other half gives pulp according to point C. Then, the average pulp will be characterized by the point B. If, on the other hand, all the pulp in the digester had the same quality, the pulp would be characterized by the point D. For the same lignin content the yield has risen from 50 to 51 per cent, that is an increase of 2 per cent, and the pulp characterized by the point D is surely much whiter than the pulp characterized by the point B. If we get to the point D with direct cooking, we come to a point somewhere about E, when we heat the cook indirectly by means of a heater, because we do not dilute the boiling acid with about 20 per cent of condensate as in direct cooking. The yield has now risen to 52 per cent or with altogether 4 per cent, as compared with point B. If we now take into account the decreased amount of screenings when we introduce a good circulation, an increased yield of 5 to 6 per cent from the wood can be explained. This increase has, in fact, been measured in a pulp mill. The measurements were carried out very carefully, the wood being measured for each cook in the wood yard. The 5-6 per cent increase of yield does, of course, not apply to all classes of pulp.

The Schauffelberger System

Owing to our conviction that liquor must be circulated properly during the whole cook, we chose at the time the Schauffelberger system of circulation as shown on Fig. 1. The liquor is taken out of the digester through screens placed near the liquor level, the main portion of the liquid being returned to the digester at the bottom and a minor part being sent to the top. This system permits a great amount of liquor to be circulated per minute and of the circulation to be maintained until the beginning of the gasing down, but of course, everything must be properly dimensioned. The introduction of a *system* is not sufficient for getting a good result. There are, further, no great difficulties in getting an efficient circulation everywhere in a digester, if the circulation rate is ample.

If a digester is filled with liquor only and if the digester is heated by means of a circulation apparatus, the hot liquid tends to collect at the top of the digester. The reason for this is that the resistance against the flow of liquid inside the digester is very

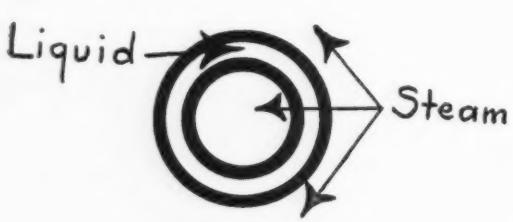


FIG. 7
Tubes with ring shaped passage for the liquid.

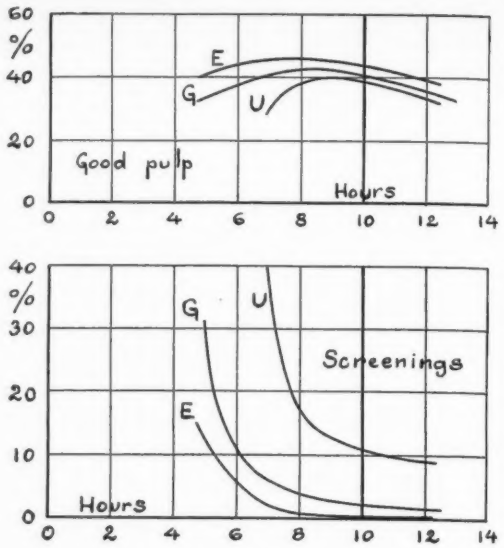


FIG. 8
Curves of Borchers and Bryde showing result with cooking after evacuation. U—no preliminary treatment. G—treated with SO_2 gas before cooking. E—digester evacuated to 15 mm. Hg—6 inches Hg absolute pressure before cooking (15 mm. Hg absolute pressure corresponds to 98 per cent vacuum).

small, so that the hot circulating liquor can take a path along a certain line without disturbing the remainder of the digester content very much and collect at the top above the colder liquor. In a digester full of chips or pulp this is not so. The chips or the pulp form a resistance against the flow. If the flow begins to pass along a certain path, the resistance is increased there and diminished at other places, and thus the flow along a path will be much limited. The closer the chips are packed in the digester, the greater is the resistance against the flow and the better the distribution of liquor. Therefore, chip filling apparatus are good accessories to circulation apparatus, and without circulation, chip filling apparatus can not be used to full advantage. The economical advantage of good chip filling is so great that a considerable amount of money can be profitably spent for a *good* circulation installation.

As the resistance against the flow in the digester increases at a constant circulation per minute, when the diameter of the digester is decreased, it is easier to get a good circulation in a long digester with a small diameter than in a short digester with a large diameter. It is, however, not easy to alter the circulation quantity per minute according to the diameter of the digester, because the heater must be dimensioned in proportion to the digester volume, and after all, we started our judgment about the circulation rate by looking at the temperature rise of the liquor in the heater. If we diminish the circulation rate with the digester diameter, a standardization of the machinery is made more difficult, and the cost of manufacture of the machinery will be increased.

Optimum Conditions

A higher cooking temperature requires an increased circulation, if the pulp quality tolerances are to be kept constant. This means that a digester working with an end temperature of 140 deg. C. would require a double circulation rate as compared with a

digester working with an end temperature of 130 deg. C., both digesters producing the same quality of pulp. To proceed this way cannot be right, because the one who cooks with a high end temperature does so, because he wants to cook quicker in order to save capital invested in the digesters, their equipment and the digester building. The circulation apparatus are rather expensive, and the prices for circulation plants are somewhat proportional to the circulation rate. An increase of the price for a circulation plant to double of the normal price for getting a good pulp with a very quick boiling is not right. It must be remembered that even if the speed of reaction in the digester is doubled at the end of the cook, the speed of impregnation of the chips with liquor is not doubled. The same applies to the time for filling and emptying the digester, so that even if the cooking speed at the end is doubled, the cooking cycle is not by far diminished by one half. There is, evidently, an economical optimum for the cooking time in each case.

It may be asserted that a mixture of different pulp qualities answers better to the paper maker's requirements than one pure quality. It would, thus, be better to work with small circulation so as to get the various pulp qualities from one cook. Such an assertion cannot be withheld. If the paper maker gets the right quality, he only needs this quality and no other, and as we have seen, the production of several different qualities which are mixed, involves a loss.

These considerations apply to the cooking of both sulphite and sulphate pulp. The difference between the circulation plants for these two kinds of pulp is, principally, that the plants are to be made of different materials and that the proportions of the plant dimensions to the digester volumes are different because of somewhat different working conditions. I think that it is an advantage to use only *one* type of apparatus for the two kinds of pulp. In this way, the scope of experience is widened, because there are two sources of observations. Also, the use of only *one* apparatus for all the purposes shows, in my opinion, that the apparatus has no faults that limit it to one specific use. In other words, I think that it is advantageous to be able to use one main type of apparatus for all the different purposes.

The net volumes of the sulphite pulp digesters equipped by NAF with circulation and heating outfits vary between 100 cu. m. (3,500 cu. ft.) and 300 cu. m. (10,500 cu. ft.), and the volumes of the sulphate pulp digesters equipped with outfits by NAF range between 35 cu. m. (1,200 cu. ft.) and 160 cu. m. (5,600 cu. ft.). The large digesters must be heated just as quickly as the little ones, and the size of the

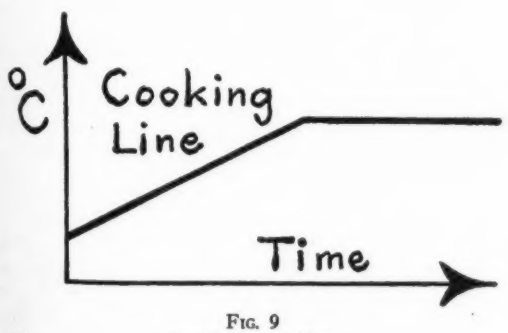


FIG. 9
Straight line cooking.

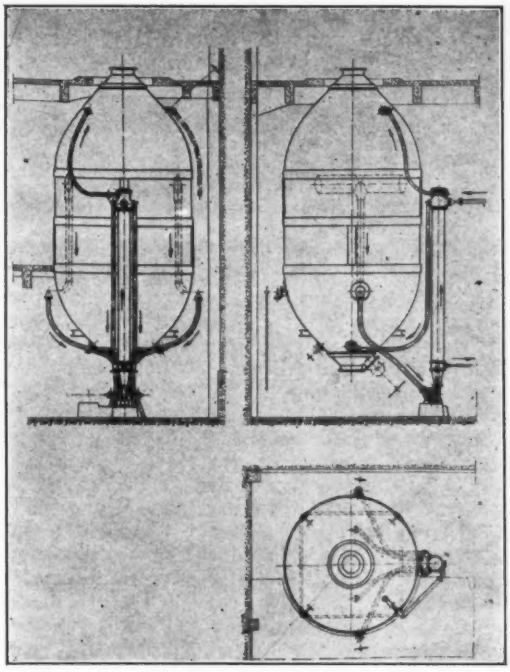


FIG. 10.
The layout of a circulation plant.

circulation outfits must, for this reason, be important for the large digesters. This is especially the case for the very large sulphate pulp digesters, and the outfits for these have involved many rather difficult engineering problems, which make the outfits the more interesting. The result was good, and now there are about twenty plants of this size of digesters running or ordered. One interesting point about these large sulphate pulp digesters is that they are always easy to empty by means of blowing, which shows that the pulp quality is uniform. If the pulp has to be blown well, it must be like a viscous fluid in the digesters. A mixture of chips or badly cooked pulp with liquor does not act as a viscous fluid and cannot be blown well. To get a viscous fluid in the digester, a uniform pulp quality is required.

Scale Formation

One much discussed feature is the formation of scale in circulation apparatus for sulphite pulp digesters. The formation of scale can be a great nuisance, and I think that some information on the matter might be of interest.

When we started making circulation plants for sulphite pulp digesters, the clients asked for guarantees that no scale would occur. The whole matter was mystic at that time. We could do nothing but give the clients some advice. The client cannot very well be asked to give a guarantee that there will be no scale in the apparatus, and the whole guarantee question has been dropped as far as the scale is concerned.

In a water solution SO_2 has a tendency to get split into sulphuric acid and sulphur. Professor F. Foerster, Dresden, and his pupils *(2)* have studied the matter profoundly and have explained the reaction mechanism. It is impossible for me to explain the process in detail here, and it may be sufficient to mention that the process is autocatalytic. The study

of the matter in practice has required some research work. We have made many analyses of acids from various mills equipped with our circulation plants, and we now have some good data. This does not mean, however, that there remains much to be done.

Every sulphite acid contains a certain amount of gypsum ($CaSO_4$). During the cook, some of the SO_2 in the acid is split, so that H_2SO_4 and sulphur are produced. Intermediate stages of the reaction are also to be found. The H_2SO_4 and the cal calcium in the acid form gypsum, the amount of which, for this reason, is increased during the cook. The initial acid may be saturated or nearly saturated with gypsum, and in this case, the new gypsum formed will cause scale to settle, especially in the heater tubes, because gypsum has a maximum solubility in the acid *below* 100 deg. C. and the hot tube walls will cause the solubility near the tube surface to sink below the amount actually dissolved per unit or volume. In bad cases scale may also occur in the pipes, in the valves and in the suction screens. The scale may grow at a great speed, and it is so annoying that one must seek to avoid it. If newly settled scale is analyzed, it is found to contain gypsum with one or two molecules of water of crystallization. In some cases one may find scale, which has once settled and which is diminishing. Such scale is exceedingly hard and contains water free gypsum. As gypsum is soluble in water to some extent, it can always be washed away, but the washing away of scale must be limited to rare occasions after something has gone wrong somewhere.

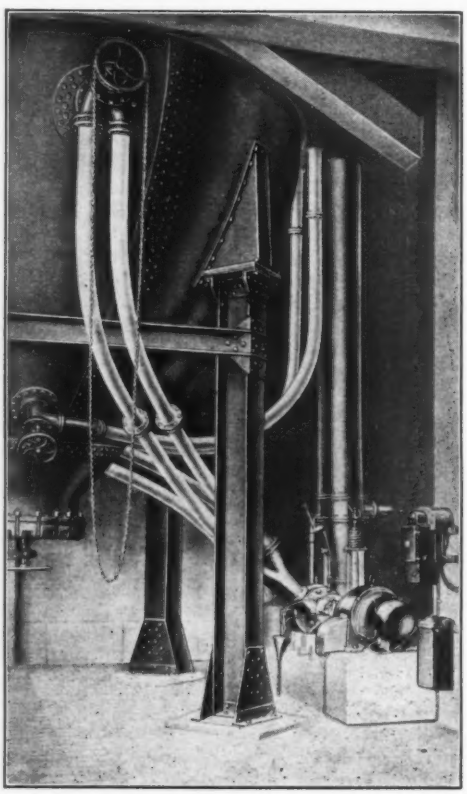


FIG. 11.
The lower part of a circulation plant. Note the good heat expansion possibilities. The heater is supported by spiral springs spanned so that the taper piece between the pump and the heater can be taken out easily.

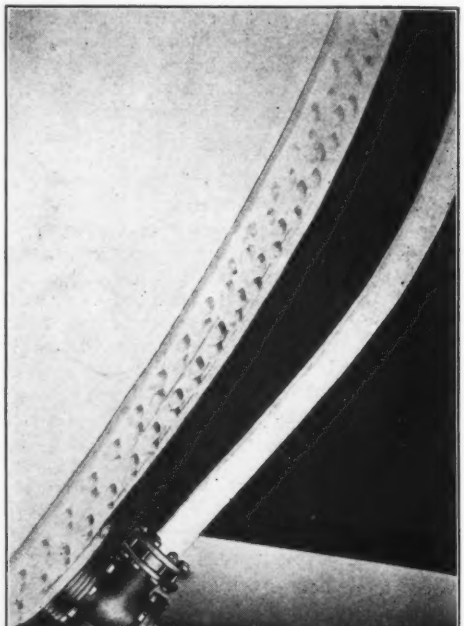


FIG. 12.
The top pipe.

My first idea after having had scale once was that the gypsum content in the initial boiling acid should be kept below a certain limit. Some time later the chemists found that catalyzers in the acid might have an appreciable influence upon the formation of scale. There was a great amount of research work done, and now we are back to my first idea again. [We have collected a great amount of analyses and the results from the practice show that if the gypsum content in the acid is sufficiently low, no scale occurs. There do not seem to be any exceptions to this rule.] One more point should, however, be observed. The cook should always be heated in such a way that the chips are properly soaked (impregnated) with acid and well sulphonated before the final heating. This will, at the same time, result in a good pulp. In accordance with our observations, scale may be avoided in every circulation plant for sulphite pulp.

Flow Through Tubes

From one side it has been claimed that the speed of acid through the tubes must exceed a certain limit, that polished tubes are necessary and that ring shaped passages in the heater tubes are required for avoiding scale. The first statement can not be right, because gypsum settles at such a great speed that the speed of the acid in the tubes does not matter much. I do not want to argue about very low speeds, which can not be used in any case because of the low heat transfer at low speeds. Polished tubes are certainly an advantage, but the expense of polishing tubes is very high, and we have limited ourselves to use tubes with a smooth surface with good results. Ring shaped passages have the object of diminishing the distance between the tube walls. If the distance between two concentric tube walls is, say, 3/8 inch, a similar movement of liquid, to the one between the

two tubes, may be had in a round tube ¾ inch in diameter. This is less than what I like to use in an apparatus for practical work, but the effect of the small tube diameter may be compensated by a somewhat increased speed of liquid. As I do not attach great importance to the speed of the liquid, I do not see the advantage of the ring shaped passages. One does not need to make any marvelous heater designs. Those who propose complicated heaters have, probably, some difficulties in keeping a good circulation and to keep it constant until the gasing down is started. The gypsum content in the acid must, of course, always be sufficiently low.

It has also been claimed that the first scale consists of monosulphite and that this scale is, afterwards, oxidized to gypsum. I had never believed in such a scale formation, because I had never been able to trace anything like it in our plants. Lately I have found, however, that monosulphite scale occurs in one of our plants, if so much acid is drawn off from the digester during the time of heating that the circulation is considerably reduced, the result being that the acid boils in the tubes. It is, however, somewhat difficult to believe that the solid monosulphite crystals should be transformed into gypsum crystals quickly. Here again a deficient circulation may account for the claim. If the circulation is kept at its maximum value until the beginning of the gasing down, the scale formation question is reduced to its proper dimensions.

With regard to scale in circulation apparatus for sulphate pulp digesters, this is quite different from

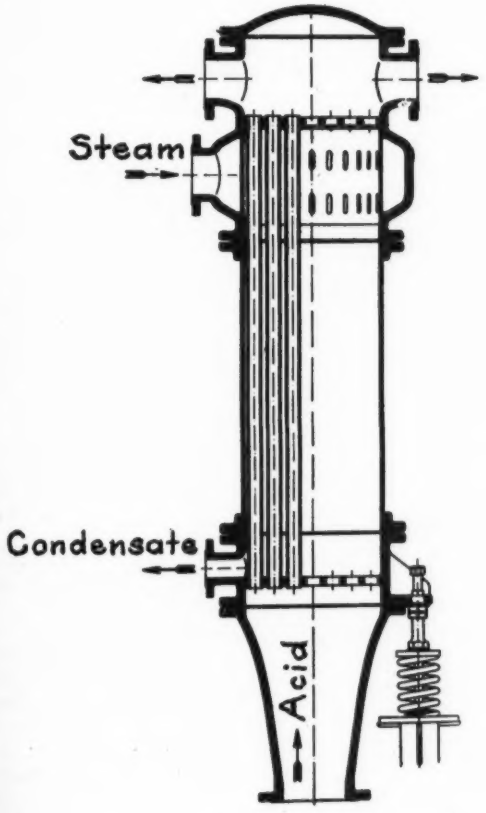


FIG. 14.
Section through the heater.

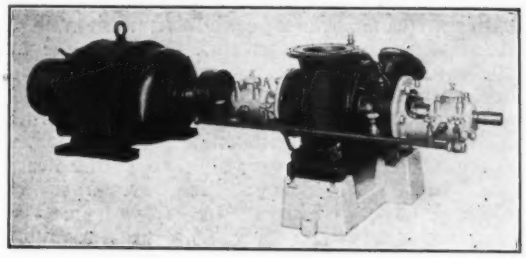


FIG. 13.
The circulation pump.

the scale in apparatus for sulphite pulp digesters. In sulphate pulp plants the scale is very hard and seems to consist of silicates to a large extent. In some sulphate pulp mills no scale occurs in the heaters, whereas in other mills the heaters have to be cleaned by means of tube scrapers every other or every third month. In such cases, the whole circulation plant must be cleaned about once every year. The melting of the soda ash and the causticizing seem to have an influence upon the formation of scale.

I have shown that the circulation and heating plants allow a quick heating at the beginning of the cook. It is desirable that this possibility be utilized, but the soaking or impregnation of the chips with acid limits the speed of heating. If the impregnation is good, the heating may be made quickly. Borchers and Bryde *(3)* have made some laboratory experiments showing what may be attained by means of evacuation before filling the digester with acid.

The heating of the cooks was made quickly, thus:

0-40 min.	15-110 deg. C.
40 min.-1 hr. 40 min.	110 deg. C.
1 hr. 40 min.-2 hr.	110-135 deg. C.

After the cooking, the amount of pulp was determined by means of screening. It is clearly shown that the evacuation had decided advantages.

Evacuation to such a low absolute pressure as 15 mm. Hg. has not been done, as far as I know, in practical work with sulphite pulp digesters, but it may be done by means of a vacuum pump. One firm (Lurgi) produces a vacuum by drawing off acid from the filled digester, whilst all the valves at the top of the digester are being kept shut. Because of the pressure of the SO_2 gas, however, this method can only provide a vacuum of about 50 per cent, and this does not correspond to the requirements, although it does some good. The old method of steaming the chips is quite a good method, but the steaming must be made well, as is seen from the following calculation.

If the steaming is made up to a temperature of say 80 deg. C., the steam pressure is 0.5 atm., and the air pressure in the digester is then also 0.5 atm. Consequently half the amount of the initial air remains. At 90 deg. C. the absolute steam pressure is 0.7 atm. and the air has a pressure of 0.3 atm. At 95 deg. C. the steam pressure is about 0.85 atm. and the air pressure about 0.15 atm. Thus 15 per cent of the initial air quantity remains at 95 deg. C. Only at 100 deg. C., when the steam has the atmospheric pressure, all the air is driven out. It is important that this be remembered, because it is often claimed that chip filling apparatus operated with steam will give a sufficient steaming. This can not be the case, because one can not possibly heat the chips to exactly

100 deg. C. by means of a chip filling apparatus. A thorough steaming must be made after the filling by means of any filling apparatus. However, the time for evacuation or steaming is not wasted, because the heating may be made much quicker after an evacuation or a steaming than if no such operation has been made. Without steaming or evacuation, the impregnation proceeds very slowly and the heating must be made at a slow rate, if good pulp is to be produced, as is well known.

Similar observations may be made for sulphate pulp cooking.

For many years, some engineers have preferred to heat the cooks along a straight line designed on a paper with regular scales (not logarithmic), as is shown in Fig. 9. I suppose that this straight line heating is based on the idea that the temperature differences in the digester must always be limited to a constant value and that this can be done by means of a constant speed of heating. Such an idea can not be right, because one can allow much greater temperature differences at low than at high temperatures, as I have shown. If we evacuate or steam the digesters before the filling with acid and if we circulate much liquid per minute, we can throw away all the old ideas about cooking curves specially suited for the practical work. We can, of course, work without evacuation or steaming too, but we cannot, then, utilize the circulation apparatus with the heaters to such extremes, which they are designed for. Naturally, this is only valid, if the circulation apparatus are properly dimensioned.

When we pronounce a judgment about a circulation plant, we must always talk of the circulation rate when the plant is running under the proper working conditions, that is to say during the daily work. The "pump capacity" is not a thing to found the judgment upon. The circulation pump is only a fraction of the whole circulation plant, and many other factors

FIG. 15.
One of the two suction screens.

than the pump capacity have an influence upon the quantity of liquor circulated per minute. The pump capacity is found when the pump is tested on a test bed before delivery from the work shop, and the result in real practice is something quite different, just as is the case with many other kinds of machinery.

It now remains for me to show some pictures of the NAF circulation apparatus. To minimize the corrosion, we must provide for ample heat expansion possibilities, because mechanical stresses cause or increase corrosion. In the NAF apparatus the heat expansion is taken up by curved, slender pipes. Another matter of importance for the avoidance of corrosions is that the liquor must not boil in the heater tubes. With the ample circulation provided for in the NAF apparatus, boiling in the heater tubes does not occur.

(Note: NAF refers to Nordiska Armaturfabrikerna, Stockholm, Sweden and represented on the American Continent by Paper Machinery, Ltd., Montreal, P. Q.)
The pictures show circulation plants for sulphite pulp digesters. The plants for sulphate pulp differ from these plants in some details.

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Factors Influencing Drainage Through Fourdrinier Wires*

By Harry G. Specht[1] and C. M. Connor[2]

Abstract

While these results are not complete enough to predict the drainage characteristics under all conditions, there are certain tendencies indicated—

1. In certain cases, at least, the length of time the alum is in contact with the stock, has little bearing on the drainage characteristics.

2. The amount of sulphuric acid required for a given pH below 6.0 is consistently less than the amount of alum required under the same conditions.

3. There is evidence that the use of sulphuric acid to acidify the stock results in a slower drainage rate for the same pH.

4. There is little evidence to indicate that the use of sulphuric acid would make any marked difference in the shape of the drainage curves at the normal pH values.

5. There is evidence that regardless of the initial pH changes without the addition of alkali, the drainage is characteristic of the pH at which the drainage tests are run and not of the initial pH.

6. The present data does not indicate any simple relation between total acidity and the drainage. There does appear to be a relationship of pH to drainage, however.

7. The presence of alkaline salts in the stock or in the water varies the pH at which the stock has the highest drainage rate.

8. There appears to be a decrease in the measur-

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 21-24, 1938.
[1] Vice President, Eastwood-Neally Corporation, Belleville, N. J.
[2] Member TAPPI, Valley Forge Laboratories, Conshohocken, Pa.

able acidity as the time of contact of alum and stock is increased.

9. The experimental data indicates there is one pH value for maximum drainage. This may change for various stock or water conditions.

In general, as yet, little can be said definitely about the effects of sulphuric acid vs. alum; or the effects of hardness on the drainage characteristics of a stock. Certain well defined trends are indicated but in order to verify them would require a great deal more investigation than has been given the problem to date. Other variables, at present not considered, may play parts which would have to be evaluated before anything more positive than a direction can be formulated.

However, from a practical standpoint, the trends may be quite sufficient as in most instances the ranges are broad enough to allow for a relatively indicative solution of a problem. Unquestionably, the type and condition of water, as well as stock contamination of all sorts, play an important part along with the structure of the wire and machine conditions, in the ultimate drainage results. A study of all the major factors may be required in each instance to understand any particular mill problem.

Continuation Study

A continuation study of the factors that influence drainage of stock on a fourdrinier wire has been carried on during the last year. As a result of the statements made last year, our work during the last year was to check the results presented at that time and to carry on the work by changing the acidity factors and to determine what influence water hardness had on the results.

We wish, as a result of this year's work, to reaffirm the conclusions outlined in the paper presented at the annual Tappi meeting, held at the Waldorf-Astoria in February, 1937.

These conclusions were as follows:

The rate of drainage is greatly affected by temperature. In general the drainage of the stock follows closely the viscosity curve of plain water.

With increase of temperature and pH the freeness decreases at a more rapid rate after the maximum increase has been reached.

TABLE I—WIRE SAMPLE KEY

Wire No.	Weave	Construction	No. Openings Per Square Inch	Per cent Open Area
		ROUND WARP		
1	Plain	59 x 38	2242	26.4
2	Plain	59 x 40	2360	26.4
3	Plain	65 x 44	2860	27.4
4	Plain	70 x 48	3360	26.7
5	Plain	70 x 52	3640	26.3
6	Plain	75 x 52	3900	25.6
7	Plain	80 x 56	4480	27.2
8	Plain	80 x 60	4800	26.8
9	Twill	59 x 38	2242	26.4
10	Twill	59 x 41	2419	25.9
11	Twill	70 x 48	3360	25.4
12	Twill	70 x 52	3640	25.2
		FLAT WARP		
13	Plain	60 x 50	3000	20.8
14	Plain	60 x 56	3360	19.7
15	Plain	60 x 60	3600	19.3
16	Plain	70 x 60	4200	21.2
17	Plain	70 x 66	4620	20.5
18	Plain	70 x 72	5040	19.6
19	Twill	45 x 40	1800	22.7
20	Twill	45 x 42	1890	22.3
21	Twill	45 x 48	2160	17.1
22	Twill	50 x 40	2000	20.8
23	Twill	50 x 44	2200	20.8
24	Twill	50 x 48	2400	19.8
25	Twill	50 x 52	2600	19.1
26	Twill	60 x 60	3600	18.1
27	Twill	60 x 62	3720	17.2

TABLE II—FURNISHES EXPRESSED IN PER CENT

1. KRAFT:
   80 kraft unbleached
   20 kraft broke
   2 size
   4 alum
   Freeness 450 cc., S.-R.
2. GLASSINE:
   80 bleached sulphite
   20 broke
   ½ size
   1¼ alum
   Freeness 160 cc., S.-R.
3. BOND:
   80 bleached sulphite
   20 bond broke
   2 size
   4 alum
   3 titanium dioxide
   Freeness 340 cc., S.-R.
4. BOOK:
   50 sulphite
   50 soda
   2 size
   4 alum
   Freeness 330 cc., S.-R.
5. TISSUE:
   100 bleached sulphite
   2 size
   4 alum
   Freeness—No. 1 450 cc.-S.R.; No. 2, 220 cc., S.-R.

There is a critical or maximum pH point for freeness for each type of furnish.

Wires can be correlated in regard to freeness.

The rate of drainage of the stock varies with the wire mesh.

A large number of wire constructions were classified from a drainage standpoint, using a C. P. glycerine solution and a news furnish, in two separate tests. The effect of varying temperatures and pH concentrations on a given news furnish were also recorded.

Types of Wire Construction Tested

The 27 wires used in these tests were of four types and are identified as follows:

Nos. 1 to 8—plain weave with round warp wire.
Nos. 9 to 12—twill weave with round warp wire.
Nos. 13 to 18—plain weave with flat warp wire.
Nos. 19 to 27—twill weave with flat warp wire.

The wire classification on a ground wood furnish having been presented in the previous paper, we now present the classifications on the other furnishes. See Table II.

Tables III, IV and V list the wires from a drainage and freeness standpoint. The wires are divided into plain weave and twill or craft weave. The num-

TABLE III

Kraft 0.125 Per cent								News 0.259 Per cent							
Drainage				Freeness				Drainage				Freeness			
Plain		Craft		Plain		Craft		Plain		Craft		Plain		Craft	
Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat
1				1				2							19
2		9				9		1				1			
3-5				2							20				20
4							21				19	2			
7					13					12				12	
		10		4							22			11	
6				3						9					22
		12		5						10		3			
			21	6						11					21
		11				10-	19-	6						10	
						12	23								
			23		15-18						21			9	
			19	7	16		22	3				5			23
8					14		24		13						
	13		20	8							24				24
	14		22			11	20				23	6			
	15						25	5				4			
	16		24		17			7				7			
	18										25		13		
	17								15				14		
			25					4							25
											27		15		
								8				8			
									14				16		
									16				17		
											26				27
									17				18		
									18						26

bers in the table refer to the wire numbers as listed in Table I. Table VI illustrates the classification of the wires for the tissue furnish. The tabulation of the wires resulting from the test run on the other furnishes were arrived at in a similar manner.

In connection with the results of the investigation of 1936, it was suggested that hydrogen ion concentration might be an influencing factor in the wire drainage determinations of various stocks. A preliminary attempt was made to discover the nature of this influence if existent and the results, when published, caused considerable comment. This initial work was by no means complete and the results were merely an indication of a trend, the full scope of which has never been fully investigated.

The work this year called for the determination of the drainage rates on four typical wire weaves at different pH values, with sulphuric acid as well as alum being used for the acidifying medium. In addition, the investigation was carried on with a typical newsprint furnish made up with water in which the hardness had been pre-established.

TABLE IV

Sulphite (Tissue) 0.113 Per cent								Glassine 0.129 Per cent							
Drainage				Freeness				Drainage				Freeness			
Plain		Craft		Plain		Craft		Plain		Craft		Plain		Craft	
Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat
2			22	2			22	1				1			
		9		1				6		10		2			
			19				19-23	2				4-6		10	
1				6				3				3			
3							24	4							20
		12		3		9		7				5		11-12	22
7						10-12				11					21-23
		10					25				20	7	13		24
			20				21			12					19
6				7				5						9	
		11					27			9	22		16		
5				4-5	13						23		14-15		
			23			11					19	8	18		
	13						20		13				17		
			21	8							24				
4					15		26		15						
			24		16				16						
			27		17						21				
			25		18						25				
	15							8							
8									17						
	14								18						
			26						14						
	16														
	17														
	18														

TABLE VI

CLASSIFICATION OF WIRES ON ALL SULPHITE (TISSUE) FURNISH—BEATEN TO SCHOPPER-RIEGLER FREENESS OF 20 cc. CONSISTENCY FOR TEST 1.127 GRAMS PER LITER.

Wire No.	Drainage Time 220 cc.	Wire No.	Drainage Volume (Freeness)
2	4.010 Sec.	22	405.0 cc.
22	4.870 "	2	402.0 "
9	5.030 "	1	388.3 "
19	5.130 "	19	385.0 "
1	5.190 "	23	385.0 "
3	5.310 "	6	382.5 "
12	5.470 "	24	381.6 "
7	5.480 "	3	380.0 "
10	5.490 "	9	380.0 "
20	5.705 "	10	377.5 "
6	5.750 "	12	377.5 "
11	5.840 "	25	376.5 "
5	5.850 "	21	375.0 "
23	5.935 "	7	374.7 "
13	6.080 "	27	372.5 "
21	6.090 "	4	370.0 "
4	6.110 "	5	370.0 "
24	6.396 "	13	370.0 "
27	6.500 "	11	368.3 "
25	6.560 "	20	367.5 "
15	6.885 "	8	363.0 "
8	7.040 "	15	360.0 "
14	7.220 "		
26	7.950 "	26	360.0 "
16	8.190 "	16	342.0 "
17	8.860 "	17	337.5 "
18	9.320 "	18	332.5 "

Shortly after the work was started in July, 1937, the complexity of the tests indicated that the investigation had best be limited to one wire.

The objective of the investigation can be outlined as follows—

The determination of the rate of drainage of a typical furnish through a typical weave wire over the pH range 4.0 to 7.0, under these conditions.

1. Alum used for acidifying the stock and in contact with the stock for (a) several hours — (b) for 30 seconds.

2. Sulphuric acid used for same purpose under the same conditions.

3. Alum used for acidification of stock in water of varied hardness.

The same methods of test were used as were described in the previous report submitted in February, 1937. To obtain the variation in hardness calcium carbonate was added to the water and allowed to stand for a period of hours.

The alum was added in a solution form to the stock suspension of a concentration of 1.3 to 1.4 grams air-dry stock per liter. With an alkaline water the alum required as a percentage of the stock present was very much higher than is ever found in normal practice for the same pH.

TABLE V

Bond (.135 Per cent)								Book (.1025 Per cent)							
Drainage				Freeness				Drainage				Freeness			
Plain		Craft		Plain		Craft		Plain		Craft		Plain		Craft	
Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat	Round	Flat
	1-2			1-2			19				19	2			
		9		3-6		9		1							19
		10	9					2			22	1			
6					13						21				22
7	4-6									9				10	
			13	4			22			10				9	
	3	12									20	5			
	7	11	10	7		10					23	6			
	5			5				5							21
			19					6				3			
			21					3							20
			23						13						
			24		14					11			13		23
	8		20	8			20				27				
	14					11	21			12		4			
	15		19										15	12	
	16		23		17-18						24			11	
		12				23-24		4							25
	17	11				12					25	7			
			20	24	15							8			
	18				16			7							24-27
	14								15						
	15								14						
	16							8					16		
											26		14-18		
									16				17		26
									18						
									17						

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp

NEW YORK IMPORTS

WEEK ENDING JULY 30, 1938

SUMMARY

Cigarette paper .....928 cs.
Wall paper .....4 cs.
Newsprint .....7,890 rolls
Printing paper .....51 rolls, 71 cs.
Wrapping paper .....2 cs.
Drawing paper .....4 cs.
Filter paper .....1 ble., 17 cs.
Bristol boards .....1 cs.
Surface baryta coated paper .....1 cs.
Surface coated paper .....63 cs.
Metal covered paper .....4 cs.
Decalcomanias .....5 cs.
Transfer paper .....15 cs.
Transfer pictures .....5 cs.
Tissue paper .....125 cs.
Tracing cloth .....24 cs.
Writing paper .....1 cs.
Crepe paper .....3 cs.
Stencil paper .....1 cs.
Paper tubes .....36 ctns., 36 cs.
Miscellaneous paper .....74 bls., 1,141 rolls, 24 cs.

CIGAR PAPER

Champagne Paper Corp., *Schodack,* Bordeaux, 100 cs.
American Tobacco Co., by same, 226 cs.
Champagne Paper Corp., *Ile de France,* Havre, 600 cs.
De Manduit Paper Corp., by same, 2 cs.

WALL PAPER

——, *American Farmer,* London, 4 cs.

NEWSPRINT

H. G. Craig Co., Inc., *Donpaco,* Donnacona, 310 rolls.
H. G. Craig Co., Inc., *Newscarrier,* Donnacona, 321 rolls.
Parsons & Whittemore, Inc., *Arna,* Sundsvall, 56 rolls.
News Syndicate Co., Inc., *Louisianan,* Comeau Bay, 5818 rolls.
Jay Madden Corp., *Scanpenn,* Wiborg, 102 rolls.
Jay Madden Corp., *Korsholm,* Kotka, 298 rolls.
Perkins Goodwin & Co., *Hansa,* Hamburg, 408 rolls.
Jay Madden Corp., by same, 212 rolls.
Jay Madden Corp., *Hansa,* Bremen, 196 rolls.
——, by same, 169 bls.

PRINTING PAPER

R. Wilson Paper Corp., *Cameronia,* Glasgow, 12 cs.
L. A. Consmiller, *Europa,* Bremen, 37 cs.
Dingelstedt & Co., *Hansa,* Bremen, 22 cs., 51 rolls.

WRAPPING PAPER

Phoenix Shipping Co., *Hansa,* Hamburg, 2 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., *American Farmer,* London, 4 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., *American Farmer,* London, 5 cs.
——, *Hansa,* Hamburg, 12 cs., 1 ble.

BRISTOL BOARDS

Devoe & Reynolds Co., Inc., *American Farmer,* London, 1 cs.

SURFACE BARYTA COATED PAPER

Globe Shipping Co., *Europa,* Bremen, 1 cs.

SURFACE COATED PAPER

Gevaert Co., of America, *Black Condor,* Antwerp, 59 cs.
Dingelstedt & Co., *Konigstein,* Antwerp, 1 cs.
J. J. Gavin Co., *Hansa,* Hamburg, 3 cs.

METAL COVERED PAPER

——, *Europa,* Bremen, 4 cs.

DECALCOMANIAS

Sellers Transportation Co., *Europa,* Bremen, 5 cs.

TRANSFER PAPER

Atlantic F'd'g Co., *Hansa,* Hamburg, 15 cs.

TRANSFER PICTURES

Rohner Gehrig & Co., *Europa,* Bremen, 5 cs.

TISSUE PAPER

Jay Madden Corp., *Hansa,* Hamburg, 125 cs.

TRACING CLOTH

C. Bruning Co., *Europa,* Bremen, 24 cs.

WRITING PAPER

H. W. Robinson Co., *Hansa,* Hamburg, 1 cs.

CREPE PAPER

International F'd'g Co., *Hansa,* Hamburg, 3 cs.

STENCIL PAPER

——, *American Farmer,* London, 1 cs.

PAPER TUBES

——, *Hansa,* Bremen, 36 cs., 36 ctns.

MISCELLANEOUS PAPER

Ensign Manfg. Co., *Terukawa Maru,* Yokohama, 6 cs.
G. Delawanna, *Ile de France,* Havre, 8 rolls.
Frismar, Inc., *Asakasan Maru,* Yokohama, 2 cs.
G. W. Sheldon & Co., by same, 7 cs.
T. N. Fairbanks Co., *Toulouse,* Yokohama, 7 cs.
Keuffel & Esser Co., *Hansa,* Hamburg, 2 cs.
——, by same, 74 bls., 1333 rolls.

RAGS, BAGGINGS, ETC.

Castle & Overton, Inc., *Schodack,* Havre, 22 bls. rags.
——, by same, 58 bls. cotton waste.
Chase National Bank, *Schodack,* Bordeaux, 105 bls. rags.
——, *Cameronia,* Glasgow, 72 lbs. paper stock.
Hughes Fawcett, Inc., by same, 73 bls. flax waste.
E. J. Keller Co., Inc., *Cameronia,* ——, 56 bls. jute waste.
Chase National Bank, *Cold Harbor,* Liverpool, 125 bls. bagging.
——, *Carinthia,* Liverpool, 35 bls. old strings, 385 bls. rags.
J. Cohen & Son Co., Inc., by same, 16 bls. rags.
Chase National Bank, by same, 80 bls. bagging.
Stone Klous & Co., Inc., *Korsholm,* Gothenburg, 7 bls. rags.
E. J. Keller Co., Inc., *Black Condor,* ——, 65 bls. bagging.
Darmstadt Scott & Courtney, *Black Condor,* Antwerp, 125 bls. bagging.
Van Oppen & Co., by same, 18 bls. rags.
——, *Konigstein,* Antwerp, 15 bls. flax waste.
E. J. Keller Co., Inc., *Teesbank,* ——, 150 bls. bagging.
E. J. Keller Co., Inc., *Vermont,* ——, 679 bls. paper stock.

BONE GLUE

——, *Vulcania,* Trieste, 100 bags.

OLD ROPE

Chase National Bank, *American Farmer,* London, 78 coils.

WOOD PULP

Bulkley Dunton Pulp Co., Inc., *Arna,* ——, 3270 bls. sulphate, 545 tons.
Johaneson Wales & Sparre, Inc., *Arna,* Sundsvall, 550 bls. sulphite, 110 tons, 12 bls. sulphate, 200 tons.
Johaneson Wales & Sparre, Inc., *Arna,* Obbola, 2100 bls. sulphate, 300 tons.

———, *Arna,* Hernosand, 5310 bls. sulphate, 885 tons.
———, *Arna,* Stugsund, 1350 bls. sulphate, 270 tons.
———, by same, 1525 bls. sulphite, 305 tons.
Absorbo Beer Pad Co., *Vulcania,* Trieste, 280 bls. wood pulp.
M. Sone, *Hansa,* Hamburg, 200 bls. wood pulp.

WOOD PULP BOARDS

Jay Madden Corp., *Scanpenn,* Wiborg, 77 rolls, 450 bls.

ALBANY IMPORTS

WEEK ENDING JULY 30, 1938

Bulkley Dunton Pulp Co., Inc., *Arna,* ———, 1500 bls. sulphite, 300 tons.
Johaneson Wales & Sparre, Inc., *Arna,* Sundsvall, 3275 bls. sulphite, 625 tons, 750 bls. sulphate, 125 tons.
Johaneson Wales & Sparre, Inc., *Arna,* Obbola, 350 bls. sulphate, 50 tons.
———, *Arna,* Stugsund, 2000 bls. sulphite, 400 tons.
———, *Ivaran,* Stugsund, 375 bls. sulphite, 75 tons.
Brown Bros., Harriman & Co., by same, 1250 bls. sulphate, 250 tons.
Bulkley Dunton Pulp Co., Inc., *Ivaran,* ———, 1000 bls. sulphite, 200 tons.
Perkins Goodwin & Co., *Ivaran,* Sundsvall, 4500 bls. sulphite, 750 tons.
Johaneson Wales & Spare, Inc., by same, 4175 bls. sulphite, 825 tons.
International Paper Co., *Heimgar,* Sheet Harbor, N. S., 1600 cords pulp wood.

BOSTON IMPORTS

WEEK ENDING JULY 30, 1938

———, *Black Falcon,* Antwerp, 31 bls. rags.
Brown Bros., Harriman & Co., *Carinthia,* Liverpool, 7 bls. rags.
G. F. Malcolm, Inc., by same, 1 cs. tissue paper.
Elliott Addressing Machine Co., *Yamabiko Maru,* Yokohama, 21 cs. paper.
M. Sone, *Capulin,* Hamburg, 200 bls. wood pulp.
Gottesman & Co., Inc., *Tunaholm,* Sweden, 600 bls. unbleached sulphite.
Gottesman & Co., Inc., *Frode,* Sweden, 3875 bls. bleached sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING JULY 30, 1938

The Lang Co., *Schodack,* Havre, 236 bls. rags.
Castle & Overton, Inc., by same, 63 bls. rags.
R. Wilson Paper Corp., *Cold Harbor,* Glasgow, 12 rolls printing paper.
———, *Black Condor,* Rotterdam, 340 bls. rags.
J. M. Hagy Waste Works, *Black Condor,* Antwerp, 45 bls. rags.
Gottesman & Co., Inc., *Frode,* Sweden, 1225 bls. bleached sulphite, 1800 bls. unbleached sulphite.

CAMDEN IMPORTS

WEEK ENDING JULY 30, 1938

Pagel Horton & Co., Inc., *Helgoy,* Sweden, 1500 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING JULY 30, 1938

Congoleum Nairn Co., *Schodack,* Havre, 410 bls. rags.
Castle & Overton, Inc., *Schodack,* St. Nazaire, 208 bls. rags.
Mead Sales Co., Inc., *Arna,* Sundsvall, 2500 bls. sulphite, 500 tons.
Parsons & Whittemore, Inc., by same, 172 rolls newsprint.
Johaneson Wales & Sparre, Inc., by same, 1000 lbs. sulphite, 200 tons, 1800 bls. sulphate, 300 tons.
Mead Sales Co., Inc., by same, 4975 bls. sulphite, 850 tons.
M. Sone, by same, 1200 bls. dry pulp, 200 tons.
Bulkley Dunton Pulp Co., Inc., *Arna,* ———, 375 bls. sulphite, 75 tons.
———, *Arna,* Hernosand, 3510 bls. sulphate, 585 tons.
———, *Arna,* Stugsund, 1125 bls. sulphate, 225 tons, 170 bls. sulphite, 34 tons.
Mead Sales Co., Inc., *Ivaran,* Sundsvall, 8175 bls. sulphite, 1450 tons.
Bulkley Dunton Pulp Co., Inc., *Ivaran,* ———, 500 bls. sulphite, 100 tons.
Parsons & Whittemore, Inc., *Ivaran,* Sundsvall, 146 rolls newsprint.
Johaneson Wales & Sparre, Inc., by same, 2700 bls. sulphate, 450 tons, 625 bls. sulphite, 125 tons.
M. Sone, by same, 600 bls. dry pulp, 100 tons.
Perkins Goodwin & Co., by same, 4260 bls. sulphate, 710 tons.
———, *Ivaran,* Stugsund, 2275 bls. sulphite, 455 tons, 250 bl. sulphate, 50 tons.
———, *Cold Harbor,* Liverpool, 257 coils old rope.
Jay Madden Corp., *Southlure,* Kotka, 73 bls. wood pulp boards.
Jay Madden Corp., by same, 985 rolls newsprint.
Scripps Howard Supply Co., Inc., by same, 75 rolls newsprint.
Pulp Sales Corp., by same, 329 bls. sulphite, 55 tons, 508 bls. mechanically ground pulp, 106 tons.
Pulp Sales Corp., *Southlure,* Traugsund, 1369 bls. sulphate, 261 tons.
Pulp Sales Corp., *Southlure,* Helsingfors, 182 bls. sulphite, 36 tons, 650 bls. mechanically ground pulp, 130 tons.
Parsons & Whittemore, Inc., *Vincent,* ———, 333 bls. wood pulp.
Parsons & Whittemore, Inc., *Waukegan,* ———, 250 bls. wood pulp.
Gottesman & Co., Inc., *Schwanheim,* Sweden, 3000 bls. unbleached sulphate, 1815 bls. unbleached sulphite.
Pagel Horton & Co., Inc., *Schwanheim,* Sweden, 1500 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING JULY 30, 1938

N. Y. Trust Co., *Cold Harbor,* Liverpool, 440 bls. bagging.
Darmstadt Scott & Courtney, *Southlure,* Gdynia, 89 bls. rags.
Pulp Sales Corp., *Southlure,* Kotka, 329 bls. sulphite, 55 tons, 508 bls. mechanically ground pulp, 101 tons.
Pulp Sales Corp., *Southlure,* Traugsund, 2188 bls. sulphate, 432 tons, 800 bls. sulphite, 160 tons.

NEWPORT NEWS IMPORTS

WEEK ENDING JULY 30, 1938

Parsons & Whittemore, Inc., *Ivaran,* Sundsvall, 51 rolls newsprint.
Mead Sales Co., Inc., by same, 4500 bls. sulphate, 750 tons.
Bulkley Dunton Pulp Co., Inc., *Ivaran,* ———, 6450 bls. sulphate, 1050 tons.
———, *Ivaran,* Stugsund, 3050 bls. sulphate, 610 tons.

CHARLESTON IMPORTS

WEEK ENDING JULY 30, 1938

Chase National Bank, *Terukawa Maru,* Kobe, 1200 bls. bagging.

GALVESTON IMPORTS

WEEK ENDING JULY 30, 1938

———, *Terukawa Maru,* Kobe, 20 bls. rags.

Ward Mill To Resume Operations

MERRILL, Wis., August 3, 1938—The Ward Paper Company will resume operations August 15. R. C. Johnson, formerly of the Northwest Paper Company has been elected vice-president in charge of sales. He will have his office in the Conway Building, Chicago. D. B. Smith, formerly with the Marathon Paper Mills Company, has been elected secretary-treasurer and manager and will be located at Merrill. The company will manufacture bleached papers for merchants' stocks and conversion purposes.

Patten Papers Files Amendment

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 1, 1938—Patten Fine Papers, Inc., has filed an amendment to its articles of incorporation with the secretary of state. The amendment provides for the buying, selling, dealing, leasing and holding of real estate. The amendment is signed by Judson G. Rosebush, Sr., president, and Judson G. Rosebush, Jr., secretary.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, August 3, 1938.

The month of August is normally a quiet one in the wholesale paper market and although this seasonal lull is now reflected in the distribution of many grades of paper, business is generally conceded to have improved during the past few weeks. Consumer buying in many grades of paper continues below expectations, but the prevailing opinion in the trade apparently concedes that the trend in both production and distribution is now definitely upward.

The majority opinion seems to favor the belief that, while a little improvement may be looked for in increased sales volume during the current month, a marked improvement in consumer buying will start in during early September. Considerable more confidence in the state of business in the future is evident in the wholesale market and it is quite generally believed that as business looks better it will result in more encouragement to make business better.

Production of many grades of paper, excluding newsprint, for the week of July 23 stood at 75.4 per cent, compared to 75.9 per cent in the preceding week and 58.3 per cent for the week of July 9th. While distribution of some grades of paper is well below this level, sales volume is being maintained at a relatively good level for this seasonally quiet period.

The newsprint market reports demand as continuing on the moderate level of the past few weeks. Prices remain firm and substantial improvement in demand is expected to set in next month.

Continued improvement is reported in sulphite papers, in writing papers and in many grades of ground wood papers. The demand for tissue papers shows an upward trend, with prices more firm than for several months.

The demand for kraft papers continues on the uptrend, though sales for the current week are under expectations. The box board market reports continued improvement. Production is now around 65 per cent, compared with 60 per cent for last week and a low rate of 37 per cent for the week of July 9th. Prices of box board continue soft, with a reduction in prices on some grades. Jute lined chip is now quoted at $42.50 to $45 per ton and kraft liner is currently priced at $42.50 to $50 per ton. Other than the changes noted, prices remain fairly firm and unchanged for this week.

Chemical Pulp

Demand for all grades of domestic and imported pulps continues on about the relatively light level which has prevailed for some weeks. Prices remain firm and it is the prevailing opinion in the trade that the trend is now definitely upward, and that a gradual improvement may be looked for, with a substantial increase in demand reasonably certain during next month.

Mechanical Pulp

The mechanical pulp market reports business as rather light. Prices are firm and conform to prevailing quotations.

Old Rope and Bagging

The demand for old rope continues very light, with little if any improvement reported for the current week. Prices remain unchanged. Improvement is reported in some grades of old bagging with higher prices on several grades, such as domestic and foreign No. 1 gunny, light and heavy wool tares, and bright bagging.

Rags

The domestic rag market continues firm, with a substantial improvement in the demand for roofing rags. The prices on No. 1 and No. 2 roofing rags are higher for the current week. The foreign rag market continues inactive, at nominal prices.

Waste Paper

The improvement in many grades of waste paper which began two weeks ago, continues. An increased demand for white envelope cuttings has resulted in higher prices during the current week. Higher quotations on white and colored ledger stock, old kraft machine compressed bales, and on No. 1 mixed paper, are reported this week.

Twine

The trend in the twine market is apparently upward. Demand is fair in some grades of hard and soft fiber twines, with a steady improvement expected to continue. Prices remain relatively firm at prevailing quotations.

A. R. Jackson Visits Boston Trade

BOSTON, Mass., August 1, 1938—A. R. Jackson, the new assistant secretary of the National Paper Trade Association of the United States in charge of wrapping paper, New York, was in Boston last week, consulting with John C. Hurd, executive secretary of the New England Paper Merchants Association, and visiting the trade.

To Represent J. L. May Co.

BOSTON, Mass., August 1, 1938—Smith, Dee & Lane, 610 Atlantic avenue, have taken over the New England selling agency of the J. L. May Company, 111 West 19th street, New York City, manufacturers of labels, tags, pin tickets, and die cut paper and board specialties for the wholesale paper and stationery trade.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, August 3, 1938.

BLANC FIXE—Quotations on blanc fixe are firm and unchanged at prevailing prices. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is quoted at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Quotations on bleaching powder are unchanged and conform to prevailing prices. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein continues fair. Domestic ground casein is quoted at 9 cents per pound; domestic finely ground at from 9½ to 10 cents per pound. All prices in bags, car lot quantities.

CAUSTIC SODA—Prices of caustic soda continue unchanged and conform to prevailing quotations. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—The demand for china clay is reported as moderate. Prices continue unchanged at prevailing quotations. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is offered at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—Prices of chlorine are firm and unchanged at prevailing quotations. Chlorine is quoted at $2.15 per 100 pounds, in single-unit cars, f.o.b., works.

ROSIN—The demand for rosin is reported as moderate. Prices of several grades are higher for the current week. "G" gum rosin is quoted at $4.70; "FF" wood rosin at $4.75 per 280, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.66 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices of salt cake are firm and unchanged at prevailing prices. Quotations range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is quoted at from $14.50 to $15 per ton, Gulf or Atlantic seaboard, on dock.

SODA ASH—Quotations on soda ash continue firm and are unchanged at prevailing prices. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The corn starch market is reported as moderately firm. Globe pearl is quoted at $2.65 per 100 pounds, in bags, and at $2.90 in barrels. Special paper starch is quoted at $2.75 per 100 pounds, in bags and at $3.00 in barrels; all prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are unchanged at prevailing prices. The commercial grades are offered at $1.15 per 100 pounds; iron free at $1.30 per 100 pounds, in barrels, car lot quantities, f.o.b., works.

SULPHUR—The prices of sulphur are firm and conform to prevailing quotations. Annual contracts are quoted at $18 per long ton, f.o.b., cars at mines. Spot and nearby car lots are offered at $21 per ton.

TALC—The prices of talc continue firm and conform to prevailing prices. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

Market Quotations

Mechanical Pulp

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$5.25	@	—
Superstandard	4.12½	@	5.00
Northern Standard Wrapping	4.50	@	—
Standard Wrapping	4.00	@	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	@	—
White No. 1½	.67½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.20	@	—
Bleached Toilet	5.26	@	—
Paper Towels—			
Unbleached	1.80	@	—
Bleached	2.10	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	$8.25	@	$9.75
No. 2 Jute	7.50	@	9.00
No. 1 Manila Wrapping, 35 lb.	5.00	@	—
No. 2 Manila Wrapping, 35 lb.	4.75	@	—
Boards, per ton—			
News	$27.50	@	$30.00
Chip	27.50	@	30.00
Sgl. Mla. Ll. Chip.	42.50	@	—
Jute Lined Chip	42.50	@	45.00
White Pat. Coated.	55.00	@	57.50
Kraft Liners	42.50	@	50.00
Binders Boards	71.00	@	77.00

The following are representative of distributors' resale prices:—

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1.	$39.10@$46.00	$40.25@$47.25
100% Rag	31.05@ 36.50	32.20@ 37.75
85% Rag		29.90@ 35.00
75% Rag	23.60@ 27.75	24.75@ 29.00
65% Rag		21.65@ 26.25
50% Rag	17.55@ 21.50	18.70@ 22.75
25% Rag	14.65@ 17.75	15.80@ 19.25

Colors at $1.00 cwt. extra

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$8.80@$10.75	$9.95@$12.00
No. 2	7.90@ 9.50	9.05@ 11.00
No. 4	7.00@ 8.50	8.20@ 10.00

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$10.80	@$12.25
No. 2 Glossy Coated	9.25@	10.50
No. 3 Glossy Coated	8.15@	9.25
No. 4 Glossy Coated	7.65@	8.75
No. 1 Antique (watermarked)	7.65@	8.75
No. 2 Offset	7.00@	8.00
A Grade E. F.	6.80@	7.75
A Grade S. & S. C.	7.05@	8.00
B Grade E. F.	6.25@	7.25
B Grade S. & S. C.	6.50@	7.50
C Grade E. F.	6.00@	7.00
C Grade S. & S. C.	6.25@	7.25
D Grade E. F.	5.70@	6.75
D Grade S. & S. C.	5.95@	7.00

Ivory & India at $.50 cwt. extra.

Paper

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	27.00	@	30.00
Dry	27.00	@	30.00

(Delivered)

No. 1 Domestic and Canadian	29.00	@	33.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.50	@	3.00
Prime Qualities—			
Easy-Bleaching Sulphite	2.15	@	2.25
Strong Unbleached Sulphite	1.85	@	2.15

(On Dock, Atlantic Ports)

Kraft Bleached	2.75	@	3.00
Kraft Light & Strong	2.00	@	2.15
Kraft No. 1	1.85	@	2.00
Kraft No. 2	1.65	@	1.80

(F.o.b. Pulp Mill)

Kraft Domestic	1.75	@	2.25

(Delivered)

Soda Bleached	2.70	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.75	@	7.00
Silesias No. 1	4.00	@	4.25
New Unbleached	6.75	@	7.00
Blue Overall	5.50	@	5.75
Fancy	2.10	@	2.25
Washables	1.60	@	1.70
Mixed Khaki Cuttings	3.25	@	3.75
O. D. Khaki Cuttings	4.00	@	4.25

Old Rags

White, No. 1—			
Repacked	3.15	@	3.40
Miscellaneous	2.60	@	2.75
White, No. 2—			
Repacked	2.10	@	2.35
Miscellaneous	1.70	@	1.80
Thirds and Blues—			
Repacked	1.40	@	1.50
Miscellaneous	1.25	@	1.30
Roofing Rags—			
No. 1	1.15	@	1.20
No. 2	1.00	@	1.10
No. 3 (bagging)	.65	@	.70
No. 4	.65	@	.70
No. 5A	.65	@	.70

Foreign Rags

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	—

ATLANTIC COAST LINE · VIRGINIA-NORTH CAROLINA-SOUTH CAROLINA-GEORGIA-FLORIDA-ALABAMA · DEVELOPMENT SERVICE

The Atlantic Coast Line Railroad, through its Development Service, will gladly furnish information regarding timberlands and available plant sites in territory served by its lines in Virginia, North Carolina, South Carolina, Georgia, Florida and Alabama to industries seeking information of this character. Inquiries may be made to:

J. M. FIELDS
Manager Development Service
Wilmington, N. C.

ATLANTIC COAST LINE RAILROAD

WOOD PULP
AGENTS

PRICE & PIERCE, Ltd.,

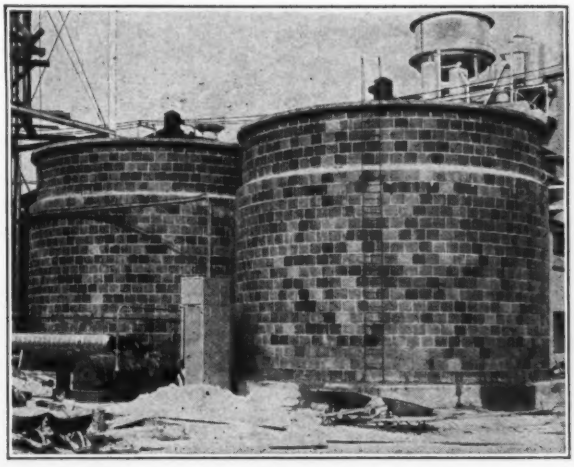
60 EAST 42nd ST.
NEW YORK

WATERBURY FELTS

Are Made By

H. WATERBURY & SONS CO.
ORISKANY, NEW YORK

Kalamazoo for TANKS

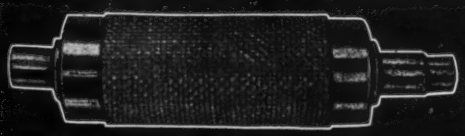


One of two sets of Vitrified Glazed Tile stock chests installed at Brunswick Pulp & Paper Mill, Brunswick, Ga. They are 24 feet in diameter inside and stand 20 feet high.

Kalamazoo Vitrified Glazed Tile Tanks for stock chests, machine chests, etc., are clean, strong, permanent, and give you freedom from maintenance cost. Write for complete information.

KALAMAZOO TANK & SILO CO.
KALAMAZOO, MICHIGAN

EMBOSSING ROLLERS



ROEHLEN ENGRAVING WORKS INC.
394 ST. PAUL ST.
ROCHESTER, N. Y.

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons..	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.40	@	2.50
Domestic	2.25	@	2.35
Wool Tares, light...	1.80	@	1.90
Wool Tares, heavy...	1.90	@	2.00
Bright Bagging.....	1.70	@	1.80
Manila Rope—			
Foreign	2.50	@	2.75
Domestic	2.25	@	2.50
Jute Threads.....	2.75	@	3.00
Sisal Strings.....	1.40	@	1.50
Mixed Strings.....	.60	@	.70

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.60	@	2.75
Ordinary Hard White No. 1....	1.90	@	2.00
Soft White No. 1..	1.75	@	1.80
Soft White Extra..	2.25	@	2.40
Flat Stock—			
Stitchless	.70	@	.75
Overissue Mag.....	.60	@	.65
Solid Flat Book...	.50	@	.55
Crumbled No. 1...	.40	@	.45
Ledger Stock White.	1.25	@	1.35
Ledger Stock Colored	.75	@	.80
New B. B. Chips....	.15	@	.20
Manila—			
New Env. Cut.....	1.40	@	1.50
New Cuttings.....	1.25	@	1.35
Old Kraft Machine—			
Compressed bales..	.65	&	.70
News—			
No. 1 White News	1.35	@	1.40
Strictly Overissue..	.40	@	.45
Strictly Folded....	.30	@	.35
No. 1 Mixed Paper..	.15	&	.20

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.11	@	.13
White Hemp.....	.12	@	.14
Fine Polished—			
Fine India.....	.15	@	.17
Unpolished—			
Box	.08½	@	—
Paper Makers.....	.07½	@	.08½
Tube Rope.....	.09	@	.10
Wall Paper.....	.10	@	.11
Wrapping	.11	@	.13
Soft Fiber Rope...	.09½	@	.11½
Cotton	.15	@	.20

(Hard Fiber)

Medium Java.....	.09	@	.10
Mex. Sisal.....	.08½	@	.09½
Manila	.18	@	.25
Domestic	2.25	@	2.50
Sisal Rope.....	1.65	@	1.85
Mixed Rope.....	.50	@	.75
Transmission Rope...	1.60	@	1.85
Soft Jute Ropes	1.65	@	1.75
Jute Carpet Threads..	.75	@	.90
Gunny Bagging—			
Foreign	2.25	@	2.30
Domestic	2.00	@	—
Bleachery Burlap....	3.00	@	3.50
Scrap Burlap—			
Foreign	1.50	@	1.60
Domestic	1.35	@	1.40
Scrap Sisal	1.25	@	1.50
Scrap Sisal for Shredding	1.75	@	1.90
Wool Tares, Heavy..	1.50	@	1.60
New Burlap Cuttings	1.75	@	2.00
Aust. Wool Pouches.	2.75	@	3.10
Heavy baling bagging	1.75	@	1.90
Paper Mill Bagging..	1.00	@	1.15
No. 2 Bagging.....	.60	@	.70

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.03	@	.03¼
New White No. 1...	.06½	@	.06¾
New White No. 2.	.05	@	.05½
New Light Flannelettes	.04¼	@	.04¾
Silesias No. 1.....	.04½	@	.04¾
New Black Silesias..	.03¾	@	.04
Silesias No. 1			
Soft Unbleached.....	.06	@	.06½
Blue Cheviots.....	.05	@	.05¼
Fancy	.03	@	.03¼
Washable	.02¾	@	.03

Cottons—According to grades—			
Blue Overalls.....	.04¼	@	.05
New Black, soft...	.03¾	@	.04
Khaki Cuttings....	.03½	@	.03¾
D. D. Khaki.....	.04	@	.04½
Corduroy	.02¾	@	.03
New Canvas.....	.06¾	@	.07¼
B.V.D. Cuttings.....	—	@	.06½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	1.75	@	2.00
Third and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings.....	3.90	@	4.00
Roofing Stock—			
No. 1.....	1.00	@	1.10
No. 2.....	.75	@	.85
No. 3.....	.65	@	.70

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....	1.00	@	1.05
Dutch Blues.....	2.65	@	2.75
New Checks and Blues	2.85	@	3.00
Old Fustians.....	2.25	@	2.50
Old Linsey Garments	2.20	@	2.25
New Silesias.....	6.00	@	6.50

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.06	@	.06¼
New White, No. 2.	.03½	@	.04
Light Silesias.....	.04	@	.04½
Silesias. No. 1....	—	@	.04½
Black Silesias, soft.	—	@	.03
New Unbleached..	.05½	@	.06
Washable, No. 1..	.01¾	@	.01½
Blue Overall.....	.04	@	.04½
Cottons—According to grades—			
Washable No. 2...	.01	@	.01¼
New Blue.....	.01	@	.01½
Fancy Percales....	—	@	.02½
New Black Soft...	.03	@	.03½
New Light Seconds	—	@	.04½
New Dark Seconds	.50	@	.75
Khaki Cuttings—			
No. 1 O. D.....	.03	@	.03½
No. 2 Mixed.....	.02	@	.02½
Corduroy	—	@	.02
New Canvas.....	.05	@	.05½
New Black Mixed.	.02½	@	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.25
Miscellaneous	2.50	@	2.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1....	—	@	.75
Domestic No. 1...	—	@	1.00
Domestic No. 2...	—	@	.85
Roofing Bagging..	—	@	.70

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.75
Domestic	1.50	@	1.75
Manila Rope.....	3.00	@	3.25
Sisal Rope.....	—	@	1.50
Mixed Rope.....	.75	@	1.00
Scrap—			
No. 1.....	—	@	1.50
No. 2.....	1.00	@	1.25
Wool Tares, heavy..	3.25	@	3.50
Mixed Strings.....	1.00	@	1.10
No. 1 New Light Burlap	2.50	@	3.00
New Burlap Cuttings	1.75	@	2.00

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White.	2.15	@	2.20
No. 2 Hard White.	2.00	@	2.10
No. 1 Soft White..	1.80	@	1.90
No. 2 Soft White..	1.25	@	1.30
No. 1 Mixed.....	.70	@	.75
Solid Ledger Stock..	1.50	@	1.60
Ledger Stock, white.	1.00	@	1.10
Ledger Stock, colored	.75	@	.80
No. 1 Books, heavy..	.65	@	.70
Manila Cuttings.....	1.50	@	1.75
Print Manila.....	.30	@	.35
Container Manila....	—	@	.40
Kraft Paper.....	.75	@	.80
No. 1 Mixed Paper..	.15	@	.20
Straw Board Chip...	.25	@	.30
Binders Board Chip.	.25	@	.30
Corrugated Board...	.50	@	.55
Overissue News.....	.50	@	.55
Old Newspapers.....	.30	@	.35

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White..	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.50	@	1.75
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.65	@	.75
No. 1 Books, light...	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.60	@	1.70
Manila Envelope Cuttings, extra quality.	2.00	@	2.10
No. 1 Old Manila...	.95	@	1.00
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	.90	@	—
Mixed Papers.....	.12½	@	—
Print Manila.....	.45	@	.55
Container Manilas...	.27½	@	—
Old Newspapers.....	.25	@	.32½
Paper Wool Strings..	.75	@	—
Overissue News.....	.45	@	.50
Box Board Chips....	.20	@	.25
Corrugated Boxes....	.27½	@	.30
Kraft corrugated boxes	.65	@	.70
Screening Wrappers..	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.40	@	2.50

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White..	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.55	@	—
Blanks	.90	@	—
Krafts	.60	@	—
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila.....	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.30	@	—
No. 1 Mixed Paper	.20	@	—
Roofing Stocks—			
No. 1.....	2.00	@	2.10
No. 2.....	1.85	@	1.90

TORONTO

Paper

Bonds and Ledgers

Delivered

No. 1 White	.36½	@	—
No. 1 Tints	.37½	@	—
No. 2 White	.26½	@	—
No. 2 Tints	.27½	@	—
No. 4 White	—	@	.1550
No. 4 Tints 16.50		@	—
No. 5 Bond—White 11.85		@	—
No. 5 Bond—Tints .12.85		@	—
No. 5 Bond—Golden Rod 13.35		@	—
No. 5 Ledger—White .1185		@	—
No. 5 Ledger—Tints. .1285		@	—
No. 6 Bond—White .10.75		@	—
No. 6 Bond—Tints .11.25		@	—
No. 6 Bond—Golden Rod 12.75		@	—
No. 7 Bond—White . 9.10		@	—
No. 7 Bond—Tints . 9.60		@	—
No. 7 Bond—Golden Rod 11.10		@	—
Book—			
No. 1 M. F. 7.35		@	—
No. 2 M. F. 6.85		@	—
No. 3 M. F. 5.60		@	—
No. 1 S. C. 7.60		@	—
No. 2 S. C. 7.10		@	—
No. 3 S. C. 6.10		@	6.35
No. 1 Coated Book and Litho 12.50		@	—
No. 2 Coated Book and Litho 11.00		@	—
No. 3 Coated Book and Litho 10.00		@	—
Coated tinted.....13.50		@	—
Wrapping—delivered—			
Rag Brown.....	4.85	@	5.35
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	6.25
No. 1 Manila.....	5.50	@	7.00
Fiber	5.50	@	—
Kraft No. 2.....	5.50	@	—

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)..$50.00		@	—
Sheets 69.50		@	—

Pulp

Ground wood.....29.00		@	—
Unbleached Sulphite..49.00		@	—
Book (Class 1).....59.00		@	—
Writing (Class 2)...57.00		@	—
Select (Class 3).....58.00		@	—
Kraft 50.00		@	—
Soda 54.00		@	56.00

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.25	@	—
Soft White.....	2.15	@	—
White Blk. News..	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.80	@	—
Light and Crumpled Book Stock.	.70	@	—
Ledgers and Writings	1.10	@	—
Manilas—			
New Manila Cut...	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue.	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06½	@	.06¾
Fancy Shirt Cuttings	.02¼	@	.02½